

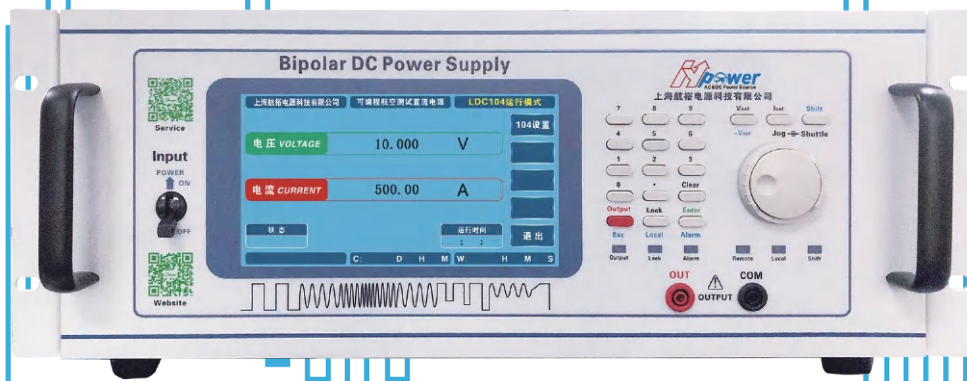
GJB181B-2012 Aircraft power supply characteristics standard

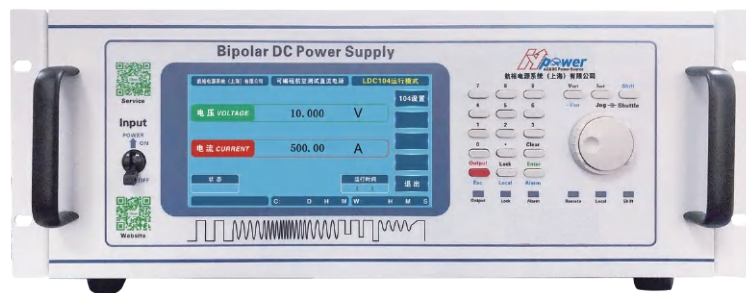
DC 28V, 270V test solutions

Hangyu Power System (Shanghai) Co., Ltd.



HY-GJBSU Series GJB Test Power Supply





Product Features

- HY-GJBSU series is a DC regulated power supply, applicable to **GJB 181B-2012, 28V, 270V aircraft power supply characteristics standard test**
- Arbitrary waveforms can be generated and timing control can be set. The "new linear technology" is used to achieve the functional advantages of low ripple, low noise and high speed response
- Output broadband: DC~10kHz/20kHz/50kHz/100kHz (CV mode)
- Output voltage: 0-1000V
- Output current: 0-500A
- Output power: 200W~10kW
- Low ripple/Low noise
- High speed response speed, voltage response time $\leq 10\mu s$
- Support front panel programming without computer software programming
- 7 inches large LCD display
- Touch screen operation & digital key input & multistage shuttle adjustment

Introduction to the GJB181B Series

- GJB 181 is the military aircraft standard of our country (The power supply characteristics and requirements of electrical equipment are specified), the standard refers to the US MIL-STD-704. This standard applies to the coordination between aircraft power supply systems, external sources and equipment. Currently GJB181 has been updated to GJB181B-2012 version, It is not only the updated version of the top-level standard of the aircraft power supply system, but also the interface standard of the power supply system and electrical equipment, which is designed to all aspects of the aircraft electrical system.
- The seven power supply types specified in GJB181 include:
 - 1、 Single-phase 115VAC/400Hz test
 - 2、 Three-phase 115VAC/400Hz test
 - 3、 Single-phase 115VAC/360~800Hz frequency conversion test
 - 4、 Three-phase 115VAC/360~800Hz frequency conversion test
 - 5、 Single-phase 220VAC/50Hz test
 - 6、 Dc voltage 28VDC test
 - 7、 Dc high voltage 270VDC test

This power supply test item: GJB 181B-2012 aircraft power supply characteristics:
28V, 270V power supply system standard requirements

GJB 181B-2012 Table 4 DC normal operating characteristics

Normal operating characteristic		28V DC system	270V DC system	Satisfy or not
Steady-state characteristic	Steady-state voltage	22.0V~29.0V	250.0V~280.0V	Satisfy
	Distortion coefficient	0.035 Max	0.015 Max	Satisfy
	Distortion frequency	Figure 13	Figure 16	Satisfy
	Pulsation amplitude	1.5V Max	6.0V Max	Satisfy
Transient characteristics	Transient of voltage	Figure 12	Figure 15	Satisfy

HB 20326.7-2016 The airborne electric equipment of power supply adaptability test method
Part 8: DC 28V

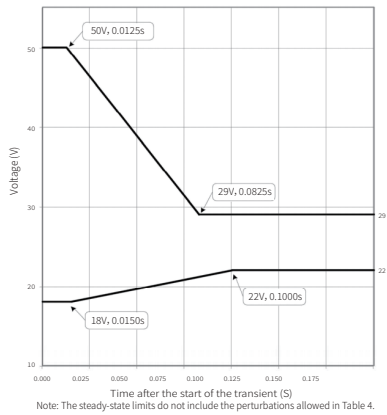
Serial number	Aircraft power supply system working status	Test item number	Test item name	Satisfy or not	Introduction page number
1	Normal	LDC101	Load characteristic	Satisfy	4
		LDC102	Normal steady-state voltage	Satisfy	5
		LDC103	Voltage distortion spectrum	Satisfy	5
		LDC104	pulsation	Satisfy	7
		LDC105	Normal voltage transient	Satisfy	8
2	Convert	LDC201	Power supply conversion interruption	Satisfy	11
3	Abnormal	LDC301	Abnormal steady-state voltage	Satisfy	12
		LDC302	Abnormal voltage transient	Satisfy	13
4	Emergency response	LDC401	Emergency normal voltage	Satisfy	16
5	Start the engine electrically	LDC501	Starting voltage transient	Satisfy	17
6	Power supply failure	LDC601	Outage	Satisfy	18
		LDC602	Reverse polarity	Satisfy	19

HB 20326.7-2016 The airborne electric equipment of power supply adaptability test method
Part 7: DC 270V

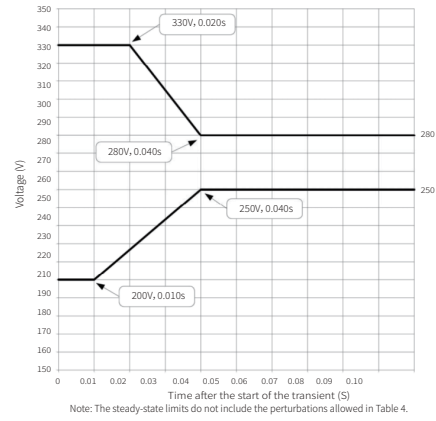
Serial number	Aircraft power supply system working status	Test item number	Test item name	Satisfy or not	Introduction page number
1	Normal	HDC101	Load characteristic	Satisfy	20
		HDC102	Normal steady-state voltage	Satisfy	21
		HDC103	Voltage distortion spectrum	Satisfy	21
		HDC104	pulsation	Satisfy	23
		HDC105	Normal voltage transient	Satisfy	24
2	Convert	HDC201	Power supply conversion interruption	Satisfy	27
3	Abnormal	HDC301	Abnormal steady-state voltage	Satisfy	28
		HDC302	Abnormal voltage transient	Satisfy	29
4	Emergency response	HDC401	Emergency normal voltage	Satisfy	32
5	Start the engine electrically	HDC501	Starting voltage transient	Satisfy	33
6	Power supply failure	HDC601	Outage	Satisfy	34
		HDC602	Reverse polarity	Satisfy	35

Test Project Waveform Diagram

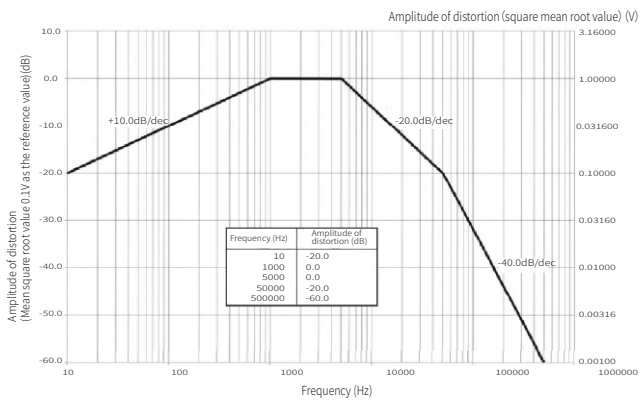
GJB 181B-2012 Figure 12 28V DC normal transient voltage envelope



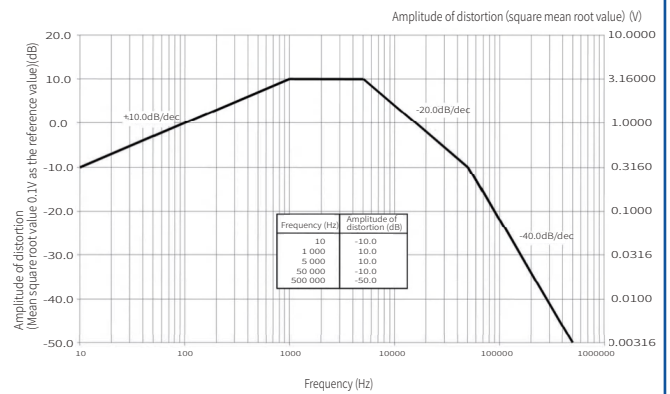
GJB 181B-2012 Figure 15 270V DC normal transient voltage envelope



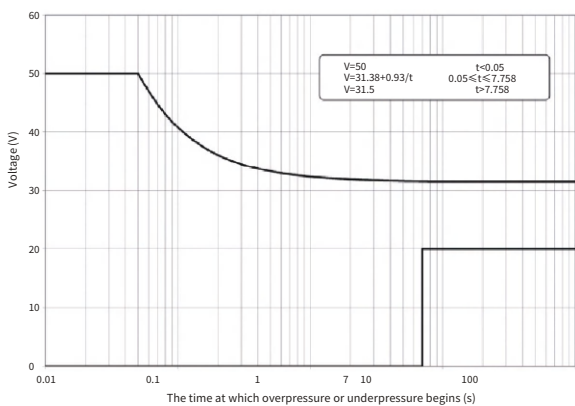
GJB 181B-2012 Figure 13 Maximum distortion spectrum of 28V DC voltage



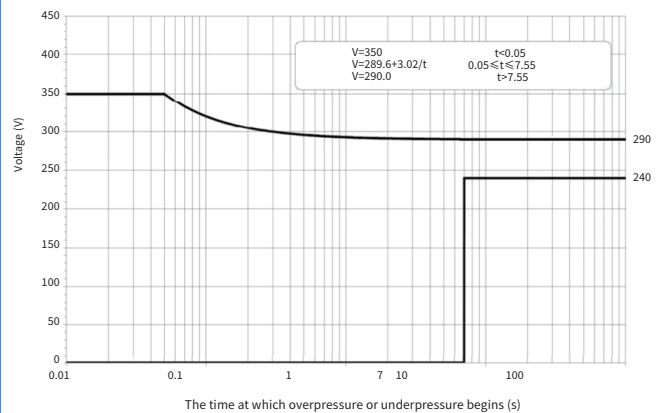
GJB 181B-2012 Figure 16 Maximum distortion spectrum of 270V DC voltage



GJB 181B-2012 Figure 14, 28 V DC abnormal working voltage limit



GJB 181B-2012 Figure 17, 270 V DC abnormal working voltage limit



1.1、LDC101 Load characteristic

This test is used to verify whether the load characteristics of the DC 28V electrical equipment comply with the provisions of GJB181B-2012 and the special specification for electrical equipment. The eligibility criteria are as follows:

Parameter	Load characteristic requirement	Corresponding to GJB181B-2012 chapter article number
Impulse current	Unless otherwise specified, for electrical equipment with power greater than 200W, the peak impact current should not be greater than 5 times the rated current, and return to the rated current at 0.1s	5.4.9
Power tolerance	Not more than 10% of the rated input power	5.4.3
Current distortion	All electrical equipment should not introduce current aberrations large enough to affect other equipment	5.4.8
Current spectrum	—	—
Current modulation	The current modulation caused by it should be minimized, and the current modulation should not cause the relevant power supply characteristic parameters of the electrical equipment to exceed the provisions of this standard	5.4.7

Note: The special specification for electrical equipment may also specify other requirements to reduce the possible adverse effects of electrical equipment on the power supply characteristics of the aircraft, such as current distortion and distortion spectrum limit, current modulation, etc.

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC101-1. Turn on the power supply and adjust the voltage to the rated value of 28V. According to the provisions of the special code for electrical equipment, the test is carried out as follows:

a. Impulse current:

Turn on the switch K, control the contactor on, suddenly add 28V (step) to the UUT, record the power-on impulse current. Then the performance test of UUT is carried out according to the performance test procedure of electrical equipment to verify that the UUT can provide its performance specified in the normal state of power supply, and the impact current test is effective. The impulse current is compared with the specified value of the special specification for electrical equipment and GJB181B-2012 to determine whether it meets the requirements.

b. Input power

Supply power to UUT, perform performance test on UUT according to the performance test procedure of electrical equipment, verify that the UUT can provide the performance specified in the normal state of power supply, record the steady-state current and voltage; Calculate the input power, and compared with the rated value in the special specification for electrical equipment, to determine whether the power tolerance meets the requirements of GJB181B-2012.

c. Current distortion

Supply power to UUT, perform performance test on UUT according to the performance test procedure of electrical equipment, verify that the UUT can provide its specified performance under normal power supply condition, record the current distortion coefficient, and compared with the specified value of the special specification for electrical equipment to determine whether the current distortion meets the requirements.

d. Current distortion spectrum

Supply power to UUT, perform performance test on UUT according to the performance test procedure of electrical equipment, verify that the UUT can provide its specified performance under normal power supply condition, record the current distortion spectrum (current amplitude/frequency), and compared with the rating in the special specification for electrical equipment to determine whether the current distortion spectrum meets the requirements.

e. Current modulation

Supply power to UUT, perform performance test on UUT according to the performance test procedure of electrical equipment, verify that the UUT can provide its specified performance under normal power supply condition, the current modulation is recorded and compared with the rating in the special specification for electrical equipment to determine whether the current modulation meets the requirements.

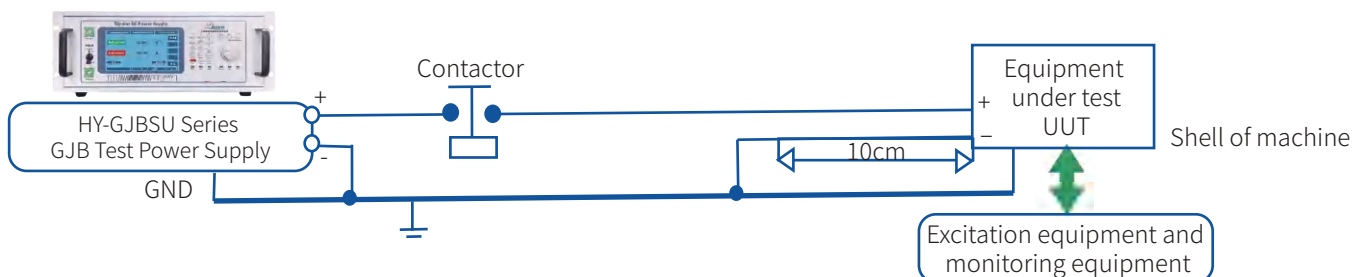


Figure LDC101-1 Typical configuration of load characteristic test system

1.2、LDC102 Normal Steady-State Voltage

This test is used to verify that when the power supply voltage of the DC 28V electrical equipment is within the normal steady-state range specified in GJB181B-2012, whether it can work properly and maintain the prescribed performance. The eligibility criteria are as follows:

Parameter	requirement	Corresponding to GJB181B-2012 chapter article number
Lower Limit of Normal Steady State Voltage (NLSS)voltage	22V	Table 4
Upper normal steady state voltage (NHSS) voltage	29V	

Test method

Preexperimental detection

Disconnect the power supply, refer to Figure LDC102-1 to install the UUT and HY-GJB series test power supplies.

Turn on the power supply and adjust the voltage to the rated 28V, supply power to the UUT, and perform a performance test on the UUT to verify that the UUT can provide the performance specified in normal condition.

Test procedure

Test condition	Voltage (V)	Duration (min)
A	22V	30
B	29V	30

According to the test conditions A and B in the above table, the power supply voltage is modulated respectively to supply power to the UUT. In each test condition, power off the UUT and then power it on again to check whether the UUT can be restarted. After restart, the UUT is tested according to the performance test procedure of electrical equipment to check whether the UUT can provide the performance specified in the normal state of power supply; The duration is not less than 30min to verify that the UUT can continuously work normally at the normal steady-state voltage limit.

The voltage, duration, whether it could be successfully restarted and the performance results of UUT were recorded under each test condition.

The above tests were repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, the power supply voltage is adjusted to the rated 28V, the UUT is supplied, and the UUT is tested for performance to confirm that the UUT is not damaged and can provide its specified performance in the normal state of power supply.

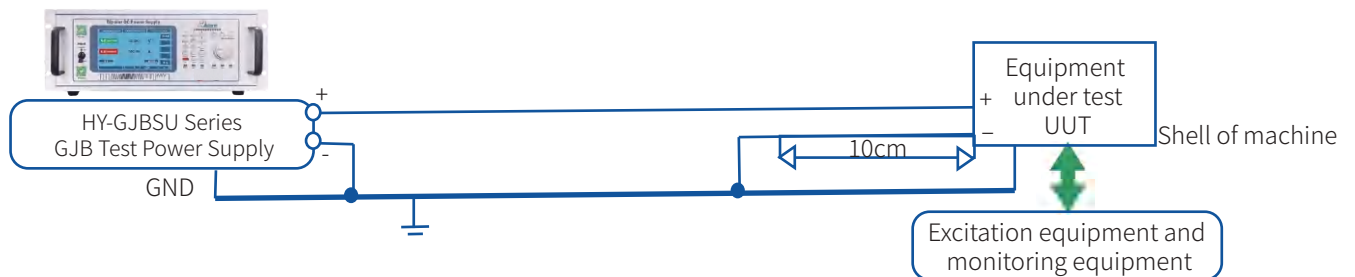


Figure LDC102-1 Typical configuration of normal steady-state voltage test system

1.3、LDC103 Voltage distortion spectrum

This test is used to verify that when the supply voltage of the DC 28V electrical equipment appears the frequency and amplitude specified in the GJB181B-2012 voltage distortion spectrum, whether it can work properly and maintain its specified performance.

The eligibility criteria are as follows:

Table LDC103-1 Spectrum Limit Of Voltage Distortion				
parameter	Requirement (Typical value)			Corresponding to GJB181B-2012 chapter article number
	Distorted spectrum (Hz)	Amplitude of distortion		
		dBV	V	
Voltage distortion spectrum	10	-20.00	0.100	Figure 13
	1000	0.00	1.000	
	5000	0.00	1.000	
	50000	-20.00	0.100	
	500000	-60.00	0.001	

Test method

Calibration procedure

Disconnect the power supply, refer to Figure LDC103-1, install the calibration resistor as the load to replace the UUT, and the current through the calibration resistor should be the same size as the UUT. Turn on the power supply and adjust the voltage to the rated value of 28V.

When referring to Figure LDC103-1, set the AC component of the output of the programmable DC power supply to sine wave. Supply power to the calibration resistor, adjust the frequency and amplitude of the sine wave (square mean root value) to make the voltage distortion at the input of the calibration resistor meet the requirements of test conditions A~K in Table LDC103-2, and record the frequency and amplitude Settings of the programmable DC power supply and/or frequency conversion power supply under each test condition.

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC103-1. Turn on the power supply and adjust the voltage to the rated value of 28V to supply power to the UUT. The performance of the UUT is tested to verify that the UUT can provide its specified performance in the normal state of the power supply.

Test procedure

Adjust the output sine wave of the programmable DC or variable frequency power supply, set it to the recorded value corresponding to each test condition in the calibration procedure, and supply power to the UUT: For test condition B, a programmable DC power supply or a variable frequency power supply is set so that its output average value is 28V DC voltage, and it is superimposed with AC sinusoidal component changing at the rate of 25Hz, and the amplitude of AC voltage was 0.158V square root mean square; Set the frequency and amplitude of voltage.

Under each test condition, the performance test of the UUT is carried out according to the performance test procedure of the electrical equipment to check whether the UUT can provide the performance specified in the normal state of power supply; The duration is not less than 5min to verify that the UUT can continue to work normally under voltage distortion. After the test of one test condition is completed, while slowly increasing the frequency of the superimposed AC component and adjusting the amplitude, the frequency and amplitude of the voltage distortion are observed, Be careful not to exceed the limit of the voltage distortion spectrum until the next test condition is reached.

The same tests were carried out for test conditions A to K in Table LDC103-2.

The voltage, frequency of voltage distortion, amplitude of voltage distortion, duration of distortion and performance results of UUT under each test condition were recorded. The test data recording table was shown in Figure LDC103-3. The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, disconnect the power supply. Turn on the power supply and adjust the voltage to the rated value of 28V, no more superimposed voltage distortion, power supply to UUT; perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

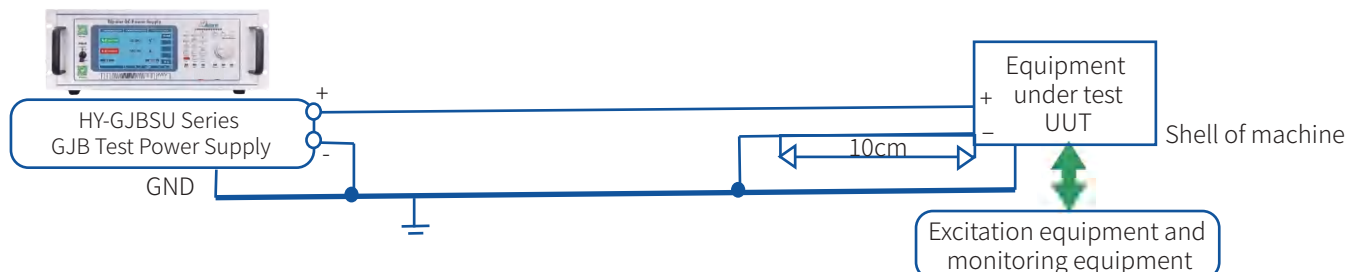


Figure LDC103-1 Typical configuration of voltage distortion spectrum test system 1

Table LDC103-2 Voltage distortion spectrum test conditions

Test condition	Distorted spectrum (Hz)	Amplitude of distortion (Square mean root value) (V)	Duration of time (min)
A	10	0.100	5
B	25	0.158	5
C	50	0.223	5
D	60	0.245	5
E	250	0.500	5
F	1K	1.000	5
G	1.7K	1.000	5
H	2K	1.000	5
I	5K	1.000	5
J	6.5K	0.769	5
K	10K	0.500	5

Note: Considering the influence of the distortion spectrum and the operability of the test method, the distortion spectrum in this test method is only set to 10kHz.

1.4、LDC104 Pulsation

This test is used to verify that when the supply voltage of the DC 28V electrical equipment is pulsating as specified in GJB181B-2012, whether it can work properly and maintain the prescribed performance.

The eligibility criteria are as follows

Table LDC104-1 Voltage ripple limit

parameter	Requirement	Corresponding to GJB181B-2012 chapter article number
Voltage pulsation	Max 1.5V	Table 4

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC104-1. Turn on the power supply and adjust the voltage to the rated value of 28V, the power supply does not output the pulsating component, and supply power to the UUT: Perform the performance test of the UUT to verify that the UUT can provide its specified performance in the normal state of power supply.

Test procedure

Turn on the power supply, set the power supply at the recorded value corresponding to test condition A in the calibration program, adjust the voltage to the rated value 28V, superimpose the set pulsation component, and supply power to the UUT. Perform the performance test on the UUT according to the performance test program of electrical equipment to check whether the UUT can provide the performance specified in the normal power supply state: The duration is not less than 30min to verify that the UUT can continuously work normally under voltage fluctuations.

The above tests were repeated according to test condition B in Table LDC104-2.

Data such as voltage, pulsation spectrum, distortion factor, duration and UUT performance results are recorded for each test condition.

The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, set the power supply to produce no pulsating voltage and adjust the voltage to the rated 28V to supply power to the UUT: Perform a performance test on the UT to confirm that the UUT is not damaged and can provide its specified performance in the normal state of supply.

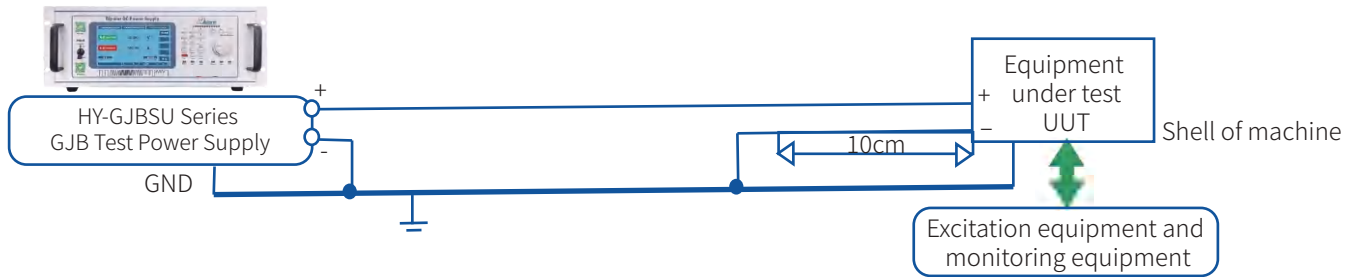


Figure LDC104-1 Typical configuration of pulsation test system

Table LDC104-2 Pulsation test condition			
Test condition	Distorted spectrum (Hz)	Amplitude of distortion (Square mean root value) (V)	Duration of time (min)
A	1200	0.80	30
	2400	0.16	
	3600	0.26	
	4800	0.08	
	6000	0.13	
	7200	0.04	
	8400	0.06	
B	2400	0.80	30
	4800	0.16	
	7200	0.26	
	9600	0.08	
	12000	0.13	
	14400	0.04	
	16800	0.06	

1.5、LDC105 Normal voltage transient

This test is used to verify that when the power supply voltage of 28V DC electrical equipment is normal voltage transient specified in GJB181B-2012, whether it can work properly and maintain the prescribed performance.

The eligibility criteria are as follows:

parameter		Power supply conversion interruption limit requirements (Typical value)		Corresponding to GJB181B-2012 chapter article number
		Transient voltage (V)	Transient voltage duration (S)	
Current distortion spectrum	Upper limit	50	0.0123	Figure 12
		29	0.0825	
	Lower limit	18	0.0150	
		22	0.1000	

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC105-1. Turn on the power supply and adjust the voltage to the rated value of 28V to supply power to the UUT; the performance of the UUT is tested to verify that the UUT can provide the performance specified in its normal state of power supply.

Normal voltage transient test procedure

Table LDC105-2 lists the voltage transients that the UUT is subject to under test conditions A~R. Within 1ms, the voltage should increase or decrease from the steady-state voltage to the transient voltage shown in Table LDC105-2. The duration of the transient voltage is shown in Table LDC105-2, after which the voltage should return to the steady state value according to the recovery time listed in the table. For the test conditions E and J, the 50V overvoltage transient duration is 10ms, each interval is 0.5s, three times. For the test conditions M and P, the 18V undervoltage transient duration is 10ms, each interval is 0.5s, and three times. For test conditions Q and R, the 18V undervoltage transient has a duration of 10ms, followed by the 50V overvoltage transient with a duration of 12.5ms, and then the voltage returns to the steady-state value. For each test condition, during each voltage transient and after the voltage returns to the normal steady-state range, the performance test of the UUT is carried out according to the performance test procedure of the electrical equipment to check whether the UUT can provide and maintain the performance specified in the normal state of power supply.

Each test condition was repeated 5 times.

Record the voltage, transient voltage, transient voltage duration, voltage transient (oscilloscope waveform) and UUT performance results under each test condition. See Figure LDC105-2 for the test data recording table.

The test was repeated in various operating modes of UUT.

Repetitive transient test procedure

The power supply provides a continuous repeatable voltage transient, with the UUT input voltage dropping linearly from 28.5V to 18V in 2.5ms, then increasing linearly to 45V in 30ms, and then decreasing linearly to 28.5V in 2.5ms. This voltage transient is repeated every 0.5s, as shown in Figure LDC105-3. Perform the performance test of UUT according to the performance test procedure of electrical equipment to check whether the UUT can provide and maintain the specified performance in the normal state of power supply; The duration is not less than 30mn to verify that the UUT can operate continuously and normally when subjected to repetitive voltage transients.

Data such as voltage, voltage transient (oscilloscope waveform), transient voltage duration and UUT performance results are recorded.

The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, the voltage is adjusted to the rated value of 28V to supply power to the UUT; Perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

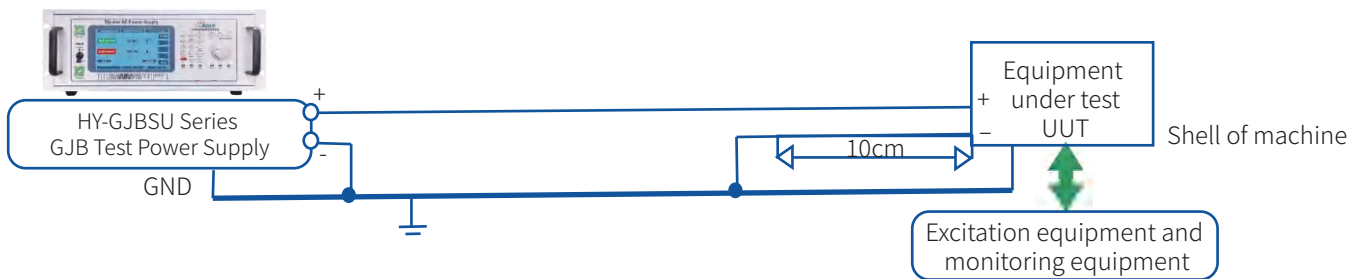


Figure LDC105-1 Typical configuration of normal voltage transient test system

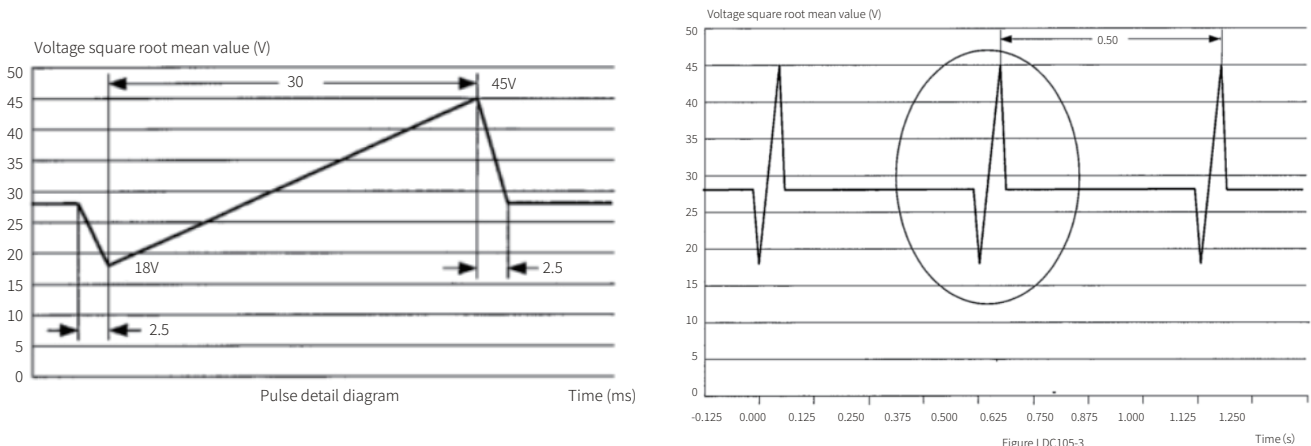


Figure LDC105-3

Table LDC105-2 Normal voltage transient test conditions					
Test condition	Steady-state voltage (V)	Time from steady-state voltage to transient voltage (ms)	Transient voltage (V)	Transient voltage duration (ms)	The time from the transient voltage to the steady state voltage or the next transient voltage
Overvoltage transients					
A	29	<1	50	12.5	<1
B	29	<1	50	12.5	70
C	29	<1	40	45	<1
D	29	<1	40	45	37.5
E	29	<1	50 (3 times)	¹⁰ (Each interval is 0.5s)	<1
F	22	<1	50	12.5	<1
G	22	<1	50	12.5	93
H	22	<1	40	45	<1
I	22	<1	40	45	60
J	22	<1	50 (3 times)	¹⁰ (Each interval is 0.5s)	<1
Under-voltage transients					
K	29	<1	18	15	<1
L	29	<1	18	15	234
M	29	<1	18 (3 times)	¹⁰ (Each interval is 0.5s)	<1
N	22	<1	18	15	<1
O	22	<1	18	15	85
P	22	<1	18 (3 times)	¹⁰ (Each interval is 0.5s)	<1
Mixed transient					
Q	After 29	<1 <1	18 50	10 12.5	<1 70
R	After 22	<1 <1	18 50	10 12.5	<1 93
Repeated transient					
S	28.5	<2.5 <3.0	18 45	—a —b	— <2.5
a Voltage gradually increases b Voltage gradually decreases					

1.6、LDC201 Interruption of power supply conversion

This test is used to verify that when the power supply voltage of the DC 28V electrical equipment is interrupted by the power supply conversion specified in GJB181B-2012, whether it can function properly and maintain its prescribed performance.

The eligibility criteria are as follows:

Table LDC201-1 Interruption limit of power supply conversion		
Parameter	Requirement	Corresponding to GJB181B-2012 chapter article number
Duration of power supply interruption	50ms	5.1
Lower limit of Normal steady State Voltage(NLSS) voltage	22V	Table 4
Upper normal steady state voltage (NHSS) voltage	29V	

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC201-1. Turn on the power and adjust the voltage to the rated value of 28V to supply power to the UUT: The performance of the UUT is tested to verify that the UUT can provide its specified performance in the normal state of the power supply.

Test procedure

Adjust the voltage setting according to the test conditions A-K in Table LDC201-2, and perform a power supply conversion interruption (0V) according to the duration listed in Table LDC201-2. The UUT input voltage should drop from the steady state value to 0V within 0.25ms, the duration is shown in Table LDC201-2, and then the voltage should return from 0V to the steady state value within 0.25ms. For test condition J, three 50ms power supply interruption tests should be carried out, with each interval of 0.5s. For test condition K, there is a 50V continuous 12.5ms after power supply interruption. The normal overvoltage transient test is then returned to the steady-state value within 70ms. For test condition L, there is a 18V continuous 15ms after power supply interruption. The normal overvoltage transient test is then returned to the steady-state value within 85ms. For each test condition, the performance test of the UUT is carried out according to the performance test procedure of the electrical equipment to check whether the UUT can provide the performance specified in the power supply conversion state: After the power supply is restored to the normal steady-state range, the UUT performance is tested again to verify that the UUT can provide its specified performance in the normal state of power supply.

Each test condition was repeated five times.

Data such as the steady-state voltage, the duration of the supply interruption and the performance results of the UUT were recorded for each test condition.

The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, the power supply voltage is adjusted to the rated value of 28V to supply power to the UUT: Perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

Table LDC201-2 Interruption limit of power supply conversion		
Test condition	Voltage (V)	Duration of time (ms)
A	28V	50
B	22V	50
C	29V	50
D	28V	30
E	22V	30
F	29V	30
G	28V	10
H	22V	10
I	29V	10
J	28V	50 (Perform three times, each interval of 0.5s)
K	28V	50 (This is followed by a normal overvoltage transient of 50V, lasting 12.5ms, and then returning to the steady state value within 70ms)
L	28V	50 (This is followed by a normal overvoltage transient of 18V, lasting 15ms, and then returning to the steady state value within 85ms)

1.7、LDC301 Abnormal steady-state voltage

This test is used to verify that when the power supply voltage of the DC 28V electrical equipment appears the abnormal steady-state voltage limit specified in GJB181B-2012, whether it can function properly and maintain its prescribed performance. The eligibility criteria are as follows:

Table LDC301-1 Abnormal steady state voltage limit		
Parameter	Requirement	Corresponding to GJB181B-2012 chapter article number
Abnormal stable voltage lower limit (ALSS) voltage	20.0V	Figure 14
Abnormal stable voltage upper limit (AHSS) voltage	31.5V	

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC301-1. Turn on the power and adjust the voltage to the rated value of 28V to supply power to the UUT: The performance of the UUT is tested to verify that the UUT can provide its specified performance in the normal state of the power supply.

Test procedure

Adjust the power supply voltage according to test conditions A and B in Table LDC301-2 respectively to supply power to the UUT. Under each test condition, power off the UUT and power it on again to check whether the UUT can be restarted. After restart, perform performance test on the UUT according to the performance test procedure of the electrical equipment to check whether the UUT can provide the performance specified in the abnormal state of power supply, with a duration of not less than 30min. Adjust the power supply voltage to the rated value of 28V, perform the performance test of the UUT according to the performance test procedure of the electrical equipment, to confirm that the UUT can automatically restore its performance specified in the normal state of power supply and is not damaged.

Data such as voltage, duration, whether the restart is successful and UUT performance results were recorded for each test condition.

The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, the power supply voltage is adjusted to the rated value of 28V to supply power to the UUT: Perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

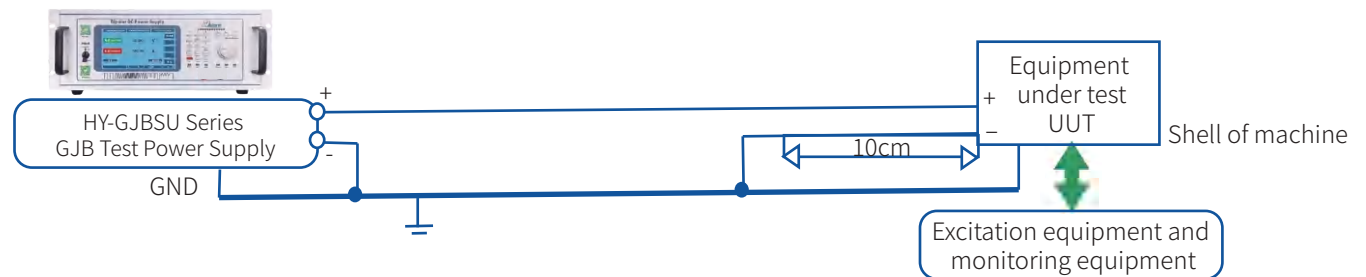


Figure LDC301-1 Abnormal steady-state voltage test conditions

Table LDC301-2 Abnormal steady-state voltage test conditions	
Test condition	Voltage (V)
A	20.0V
B	31.5V

1.8、LDC302 Abnormal voltage transient

This test is used to verify that when the power supply voltage of 28V DC electrical equipment appears abnormal stable voltage transient specified in GJB181B-2012, whether it can function properly and maintain its prescribed performance.

The eligibility criteria are as follows:

Table LDC302-1 Transient limit of abnormal voltage				
Parameter		Requirement (Typical value)		Corresponding to GJB181B-2012 chapter article number
		Transient voltage (V)	Transient voltage duration (S)	
Abnormal voltage transient	overvoltage	50	<0.05	Figure 14
		$31.38+0.931/t$	0.05~7.758	
	31.5	>7.758		
	undervoltage	0	7	—

Note: The undervoltage limit curve (0V, 7s) in FIG. 14 of GJB 181B-2012 is an extreme case of abnormal voltage transient of the aircraft power supply system, that is, power supply failure, and should not be used as a qualified criterion for this test project.

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC302-1. Turn on the power and adjust the voltage to the rated value of 28V to supply power to the UUT: The performance of the UUT is tested to verify that the UUT can provide its specified performance in the normal state of the power supply.

Test procedure

Table LDC302-2 specifies the voltage that the UUT should withstand under each test condition A~N. The transient input voltage should rise or fall from the steady-state voltage to the transient voltage within 1ms, its duration is shown in LDC302-2, and then the voltage returns to the steady-state value according to the time listed in the table.

For test conditions C and F, the 50V overvoltage transient duration is 50ms, each interval is 0.5s, three times. For test conditions I and L, the duration of 7V undervoltage transients is 50ms, each interval is 0.5s. Do it three times. For test conditions M and N, a 7V undervoltage transient with a duration of 10ms is immediately followed by a 50V overvoltage transient with a duration of 50ms, and finally the voltage returns to the steady state value. For each test condition, during the voltage transient period, the performance of the UUT was monitored according to the electrical equipment performance test procedure to check whether the UUT could provide its specified performance in the abnormal state of power supply. Each test condition was repeated 5 times. After the power supply is restored to the normal steady-state range, the UUT is tested to verify that the UUT can automatically restore its performance as specified in the normal state of power supply.

Record the steady-state voltage, transient voltage, transient voltage duration, voltage transient (oscilloscope waveform) and UUT performance results under each test condition.

The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, the power supply voltage is adjusted to the rated value of 28V to supply power to the UUT: Perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

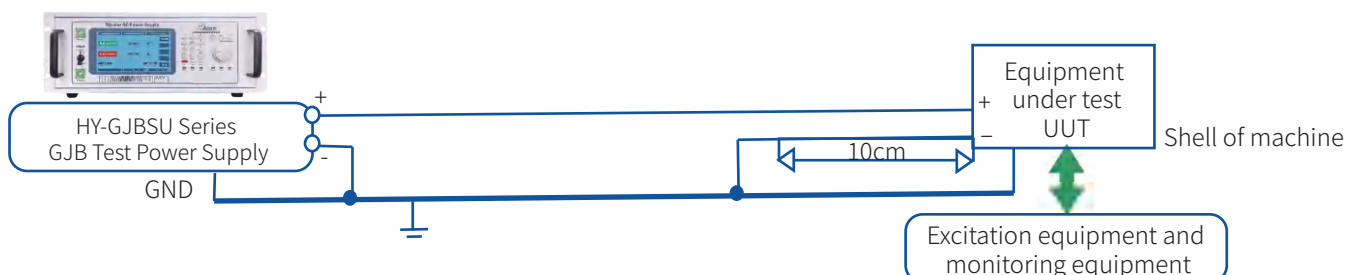


Figure LDC302-1 Typical configuration of non-normal voltage transient test system

Table LDC302-2 Abnormal voltage transient test conditions					
Test condition	Steady-state voltage (V)	Time from steady-state voltage to transient voltage (ms)	Transient voltage (V)	Transient voltage duration (ms)	The time from the transient voltage to the steady state voltage or the next transient voltage
Overvoltage transients					
A	29	<1	50	50	<1ms
B	29	<1	50	50	18ms
		—	45	—a	40ms
		—	40	—a	149ms
		—	35	—a	4.743s
		—	30	—a	1s
		—	29	—	—
C	29	<1	50 (3 times)	50 (Each interval is 0.5s)	<1ms
D	22	<1	50	50	<1ms
E	22	<1	50	50	18ms
		—	45	—a	40ms
		—	40	—a	149ms
		—	35	—a	4.743s
		—	30	—a	8s
		—	22	—	—
F	22	<1	50 (3 times)	50 (Each interval is 0.5s)	<1ms
Under-voltage transients					
G	29	<1	7	50	<1ms
H	29	<1	7	50	18ms
		—	12	—b	40ms
		—	17	—b	149ms
		—	22	—b	4.743s
		—	28	—b	1s
		—	29	—	—

Table LDC302-2 Abnormal voltage transient test conditions					
Test condition	Steady-state voltage (V)	Time from steady-state voltage to transient voltage (ms)	Transient voltage (V)	Transient voltage duration (ms)	The time from the transient voltage to the steady state voltage or the next transient voltage
Undervoltage transient					
I	29	<1	7 (3 times)	50 (Each interval is 0.5s)	<1ms
J	22	<1	7	50	<1ms
k	22	<1	7	50	18ms
		—	12	—b	40ms
		—	17	—b	149ms
		—	22	—	—
L	22	<1	7 (3 times)	50 (Each interval is 0.5s)	<1ms
Mixed transient					
M	29	<1	7	10	<1ms
		<1	50	50	80ms
		—	45	—a	40ms
		—	40	—a	149ms
		—	35	—a	4.743s
		—	30	—a	1s
N	22	<1	18	10	<1ms
		<1	50	50	18ms
		—	45	—a	40ms
		—	40	—a	149ms
		—	35	—a	4.743s
		—	30	—a	8s
a Voltage gradually increases b Voltage gradually decreases					

1.9、LDC401 Emergency steady-state voltage

This test is used to verify that when the supply voltage of the DC 28V electrical equipment appears the emergency steady-state voltage limit specified in GJB181B-2012, whether it can function properly and maintain its prescribed performance.

The eligibility criteria are as follows:

parameter	Requirement	Corresponding to GJB181B-2012 chapter article number
Emergency steady State Voltage Lower limit (ELSS) voltage	18V	5.3.2.3
Emergency stable voltage Upper limit (EHSS) voltage	29V	

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC401-1. Turn on the power and adjust the voltage to the rated value of 28V to supply power to the UUT: The performance of the UUT is tested to verify that the UUT can provide its specified performance in the normal state of the power supply.

Test procedure

Adjust the power supply voltage according to the test conditions A and B in Table LDC401-2 respectively to supply power to the UUT. Under each test condition, power off the UUT and then power it on again to check whether the UUT can be restarted. After restart, perform performance test on the UUT according to the performance test procedure of the electrical equipment to check whether the UUT can provide the performance specified in the emergency power supply state: the duration is not less than 30min, so as to verify that the UUT can continuously work normally under the emergency steady-state voltage limit.

Adjust the power supply voltage to the rated value of 28V, perform the performance test of the UUT according to the performance test procedure of the electrical equipment, to confirm that the UUT can automatically restore its performance specified in the normal state of power supply and is not damaged.

Data such as voltage, duration, whether the restart is successful and UUT performance results were recorded for each test condition.

The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, the power supply voltage is adjusted to the rated value of 28V to supply power to the UUT: Perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

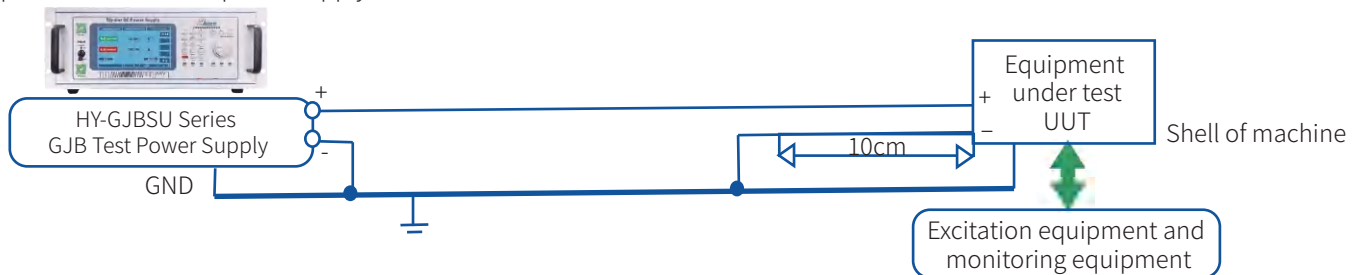


Figure LDC401-1 Typical configuration of emergency steady-state voltage test system

Test condition	Voltage (V)	Duration of time (min)
A	18V	30
B	29V	30

2.0、LDC501 Starting voltage transient

This test is used to verify that when the supply voltage of DC 28V electrical equipment is the starting voltage transient specified in GJB181B-2012, whether it can work properly and maintain the prescribed performance.

The eligibility criteria are as follows:

Table LDC501-1 Transient limit of starting voltage		
parameter	Requirement	Corresponding to GJB181B-2012 chapter article number
Starting voltage transient	12V~29V	5.3.2.4

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC501-1. Turn on the power and adjust the voltage to the rated value of 28V to supply power to the UUT: The performance of the UUT is tested to verify that the UUT can provide its specified performance in the normal state of the power supply.

Test procedure

The UUT shall withstand the starting voltage transients specified in Table LDC501-2, in which the input voltage decreases from the steady-state value to 12V within 1ms and then increases to the steady-state value at a constant rate within 30s. During each start-up voltage transient, the performance of the UUT was tested according to the electrical equipment performance test procedure to check whether the UUT could provide its specified performance in the electrical start-up state. Repeat five times.

Record steady-state voltage, transient voltage, recovery time, voltage transient (oscilloscope waveform) and UUT performance results.

After the power supply is restored to the normal steady state range, the UUT performance test is carried out to verify that the UUT can automatically restore its performance specified in the normal state of power supply.

The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, the power supply voltage is adjusted to the rated value of 28V to supply power to the UUT: Perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

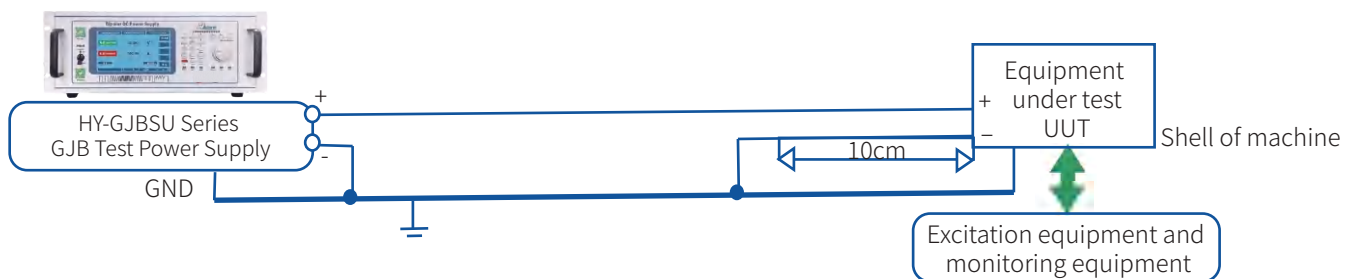


Figure LDC501-1 Typical configuration of starting voltage transient test system

Table LDC501-2 Starting voltage transient test conditions				
Test condition	Steady-state voltage (V)	Time from steady-state voltage to transient voltage (ms)	Transient voltage	The time from the transient voltage to the steady state voltage or the next transient voltage (ms)
A	29V	<1ms	12V	30s

2.1、LDC601 Power failure

This test is used to verify that when the power supply voltage of the DC 28V electrical equipment is cut off according to GJB181B-2012, whether it can work properly and maintain the prescribed performance.

The eligibility criteria are as follows:

Table LDC601-1 Power off limit		
parameter	Requirement	Corresponding to GJB181B-2012 chapter article number
Power failure	7s	Table 14

Test method

Pretest inspection

Disconnect the power supply and refer to Figure LDC601-1 to install the UUT and HY-GJB series test power supply. Turn on the power and adjust the voltage to the rated value of 28V to supply power to the UUT: The performance of the UUT is tested to verify that the UUT can provide its specified performance in the normal state of the power supply.

Test procedure

The blackout (0V) test was performed according to the duration listed in Table LDC601-2 for each test condition A to D. The UUT input voltage should drop from the steady state voltage to 0V within 0.25ms. The duration of holding 0V is shown in Table LDC601-2, and then the voltage returns from 0V to the steady state value at 0.25ms. For each test condition, the performance test of the UUT is carried out according to the performance test procedure of the electrical equipment to check whether the UUT can provide its specified performance in the condition of power supply failure. After the power supply is restored to the normal steady state range, the performance test of the UUT is carried out according to the performance test procedure of the electrical equipment. To verify that the UUT can automatically recover to its specified performance in the normal state of power supply and is not damaged.

Data such as voltage, outage duration and UUT performance results are recorded for each test condition.

Each test condition was repeated 5 times.

The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, the power supply voltage is adjusted to the rated value of 28V to supply power to the UUT: Perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

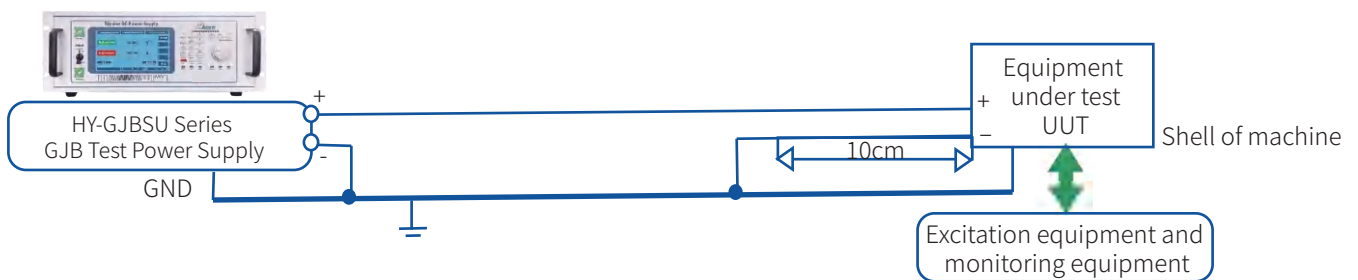


Figure LDC601-1 Typical configuration of power failure test system

Table LDC601-2 Power off test condition	
Test condition	Voltage (V)
A	100ms
B	500ms
C	3s
D	7s

2.2、LDC602 Reverse polarity

This test is used to verify that the DC 28V electrical equipment will not be damaged when the supply voltage is reversed polarity, or take effective physical measures to prevent the occurrence of reverse polarity.

The eligibility criteria are as follows:

Table LDC602-1 Reverse polarity fault		
parameter	Requirement	Corresponding to GJB181B-2012 chapter article number
Reverse polarity fault	The DC equipment should not be damaged due to the reverse connection of positive and negative lines. To prevent input polarity or phase sequence reversal, this requirement can be achieved using proven physical methods.	5.4.6

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC602-1. Turn on the power and adjust the voltage to the rated value of 28V to supply power to the UUT: The performance of the UUT is tested to verify that the UUT can provide its specified performance in the normal state of the power supply.

Test procedure

Consistency check

If effective physical measures have been taken to prevent the occurrence of reverse polarity, the effectiveness of such measures should be verified to confirm that positive and negative lines cannot be reversed.

If the positive and negative lines may be reversed or the measures taken are ineffective, the following tests are performed.

Test procedure

Disconnect the power supply and refer to Figure LDC602 1-2 (positive and negative polarity connection) to install the UUT, excitation equipment and monitoring equipment (When the test power supply can produce negative polarity output, still connect according to Figure LDC602-1, the test power supply can be set to negative voltage output). Turn on the power supply and adjust the voltage to the rated value of 28V to supply power to the UUT; When the power input is in reverse polarity state, keep the power supply for at least 30 minutes to verify that the UUT will not be damaged or cause unsafe state due to the power input wire connection.

Data such as steady-state voltage, reverse polarity duration and UUT performance results are recorded.

The above tests were repeated in various operating modes of UUT.

Post-test inspection

Disconnect the power supply and install the UUT, excitation equipment and monitoring equipment according to Figure LDC602-1 (positive and negative lines are correctly connected). Turn on the power supply and adjust the voltage to the rated value of 28V, supply power to the UUT to ensure that the UUT has not been damaged or caused an unsafe condition due to the reverse polarity of the supply, maintain power supply at least 30mn: Perform performance tests on the UUT according to the electrical equipment performance test procedure to confirm that the UUT has recovered its performance as specified in the normal state of power supply and is not damaged.

Record steady-state voltage, duration of test conditions and UUT performance results. See Figure LDC602-3 for the test data records.

The above tests were repeated in various operating modes of UUT.

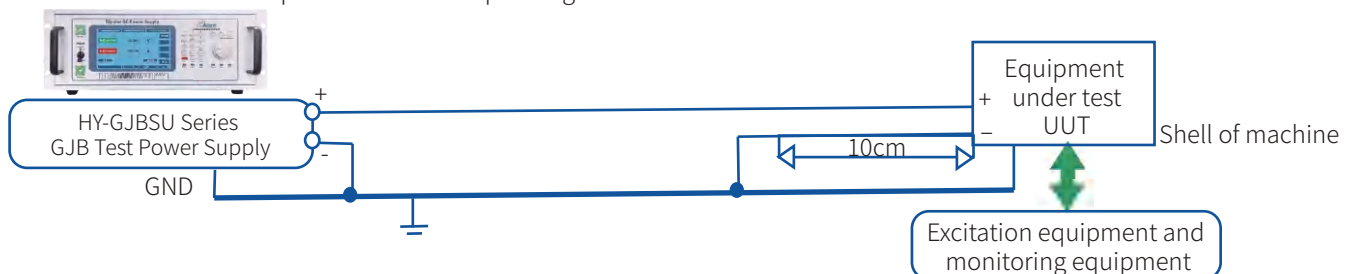


Figure LDC602-1 Typical configuration of polarity correct connection test system

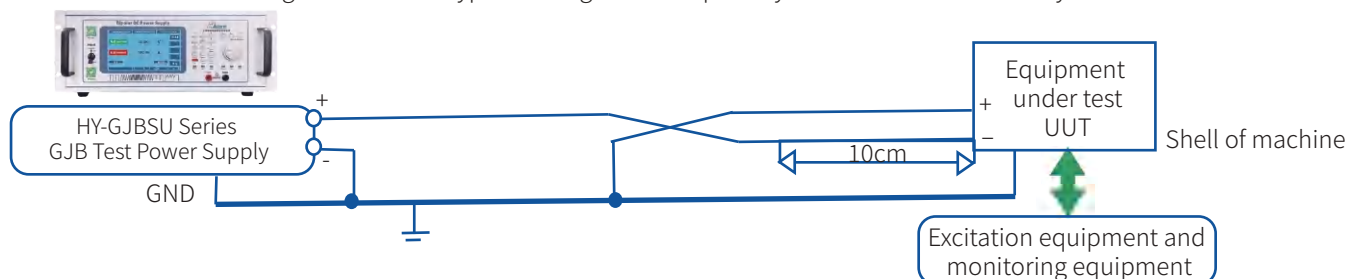


Figure LDC602-2 Typical configuration of reverse polarity connection test system

2.3、HDC101 Load characteristic

This test is used to verify whether the load characteristics of the DC 270V electrical equipment comply with the provisions of GJB181B-2012 and the special specification for electrical equipment.
The eligibility criteria are as follows:

Parameter	Load characteristic requirement	Corresponding to GJB181B-2012 chapter article number
Impulse current	Unless otherwise specified, for electrical equipment with power greater than 200W, the peak impact current should not be greater than 5 times the rated current, and return to the rated current at 0.1s	5.4.9
Power tolerance	Not more than 10% of the rated input power	5.4.3
Current distortion	All electrical equipment should not introduce current aberrations large enough to affect other equipment	5.4.8
Current spectrum	—	—
Current modulation	The current modulation caused by it should be minimized, and the current modulation should not cause the relevant power supply characteristic parameters of the electrical equipment to exceed the provisions of this standard	5.4.7

Note: The special specification for electrical equipment may also specify other requirements to reduce the possible adverse effects of electrical equipment on the power supply characteristics of the aircraft, such as current distortion and distortion spectrum limit, current modulation, etc.

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC101-1. Turn on the power supply and adjust the voltage to the rated value of 270V. According to the provisions of the special code for electrical equipment, the test is carried out as follows:

a. Impulse current:

Turn on the switch K, control the contactor on, suddenly add 270 V(step) to the UUT, record the power-on impulse current. Then the performance test of UUT is carried out according to the performance test procedure of electrical equipment to verify that the UUT can provide its performance specified in the normal state of power supply, and the impact current test is effective. The impulse current is compared with the specified value of the special specification for electrical equipment and GJB181B-2012 to determine whether it meets the requirements.

b. Input power

Supply power to UUT, perform performance test on UUT according to the performance test procedure of electrical equipment, Verify that the UUT can provide the performance specified in the normal state of power supply, record the steady-state current and voltage; Calculate the input power, And compared with the rated value in the special specification for electrical equipment, to determine whether the power tolerance meets the requirements of GJB181B-2012.

c. Current distortion

Supply power to UUT, perform performance test on UUT according to the performance test procedure of electrical equipment, Verify that the UUT can provide its specified performance under normal power supply condition, record the current distortion coefficient, And compared with the specified value of the special specification for electrical equipment to determine whether the current distortion meets the requirements.

d. Current distortion spectrum

Supply power to UUT, perform performance test on UUT according to the performance test procedure of electrical equipment, Verify that the UUT can provide its specified performance under normal power supply condition, Record the current distortion spectrum (current amplitude/frequency), And compared with the rating in the special specification for electrical equipment to determine whether the current distortion spectrum meets the requirements.

e. Current modulation

Supply power to UUT, perform performance test on UUT according to the performance test procedure of electrical equipment, Verify that the UUT can provide its specified performance under normal power supply condition, The current modulation is recorded and compared with the rating in the special specification for electrical equipment to determine whether the current modulation meets the requirements.

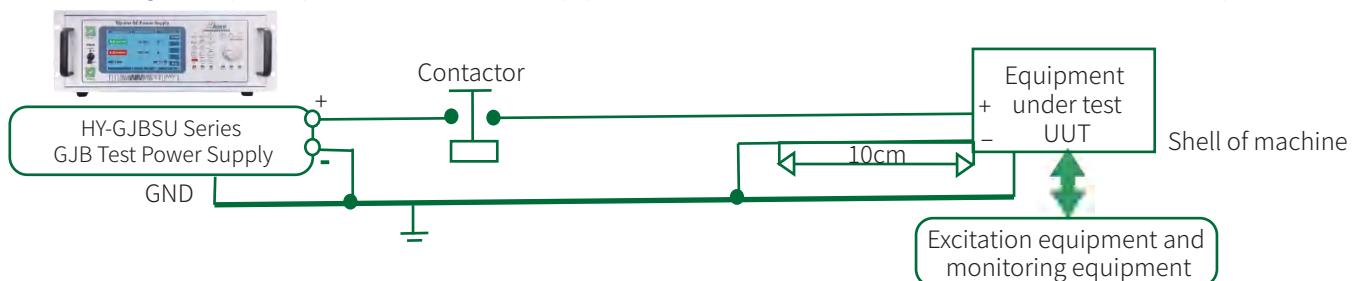


Figure LDC101-1 Typical configuration of load characteristic test system

2.4、HDC102 Normal Steady-State Voltage

This test is used to verify that when the power supply voltage of the DC 270V electrical equipment is within the normal steady-state range specified in GJB181B-2012, whether it can work properly and maintain the prescribed performance. The eligibility criteria are as follows:

Table LDC102-1 Normal steady-state voltage limits		
Parameter	Requirement	Corresponding to GJB181B-2012 chapter article number
Lower Limit of Normal Steady State Voltage (NLSS)voltage	250V	Table 4
Upper normal steady state voltage (NHSS) voltage	280V	

Test method

Preexperimental detection

Disconnect the power supply, refer to Figure LDC102-1 to install the UUT and HY-GJB series test power supplies.

Turn on the power supply and adjust the voltage to the rated 270V, supply power to the UUT, and perform a performance test on the UUT to verify that the UUT can provide the performance specified in normal condition.

Test procedure

Test condition	Voltage (V)	Duration (min)
A	250V	30
B	280V	30

According to the test conditions A and B in the above table, the power supply voltage is modulated respectively to supply power to the UUT. In each test condition, power off the UUT and then power it on again to check whether the UUT can be restarted. After restart, the UUT is tested according to the performance test procedure of electrical equipment to check whether the UUT can provide the performance specified in the normal state of power supply; The duration is not less than 30min to verify that the UUT can continuously work normally at the normal steady-state voltage limit.

The voltage, duration, whether it could be successfully restarted and the performance results of UUT were recorded under each test condition.

The above tests were repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, the power supply voltage is adjusted to the rated value of 270V to supply power to the UUT: Perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

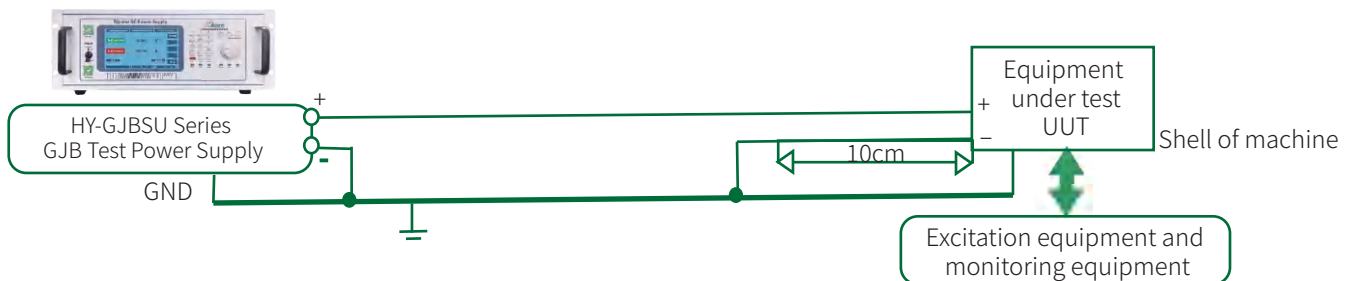


Figure LDC102-1 Typical configuration of normal steady-state voltage test system

2.5、HDC103 Voltage distortion spectrum

This test is used to verify that when the supply voltage of the DC 270V electrical equipment appears the frequency and amplitude specified in the GJB181B-2012 voltage distortion spectrum, whether it can work properly and maintain its specified performance.

The eligibility criteria are as follows:

Table LDC103-1 Spectrum Limit Of Voltage Distortion				
Parameter	Requirement (Typical value)			Corresponding to GJB181B-2012 chapter article number
	Distorted spectrum (Hz)	Amplitude of distortion		
		dBV	V	
Voltage distortion spectrum	10	-10.00	0.316	Figure 16
	1000	0.00	3.160	
	5000	0.00	3.160	
	50000	-10.00	0.316	
	500000	-50.00	0.003	

Test method

Calibration procedure

Disconnect the power supply, refer to Figure LDC103-1, install the calibration resistor as the load to replace the UUT, and the current through the calibration resistor should be the same size as the UUT. Turn on the power supply and adjust the voltage to the rated value of 270V.

When referring to Figure LDC103-1, set the AC component of the output of the programmable DC power supply to sine wave. Supply power to the calibration resistor, adjust the frequency and amplitude of the sine wave (square mean root value) to make the voltage distortion at the input of the calibration resistor meet the requirements of test conditions A~K in Table LDC103-2, and record the frequency and amplitude Settings of the programmable DC power supply and/or frequency conversion power supply under each test condition.

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC103-1. Turn on the power supply and adjust the voltage to the rated value of 270V to supply power to the UUT. The performance of the UUT is tested to verify that the UUT can provide its specified performance in the normal state of the power supply.

Test procedure

Adjust the output sine wave of the programmable DC or variable frequency power supply, set it to the recorded value corresponding to each test condition in the calibration procedure, and supply power to the UUT: For test condition B, a programmable DC power supply or a variable frequency power supply is set so that its output average value is 270V DC voltage, and it is superimposed with AC sinusoidal component changing at the rate of 10Hz, and the amplitude of AC voltage was 0.316V square root mean square; Set the frequency and amplitude of voltage distortion specified in table HDC103-2 in turn.

Under each test condition, the performance test of the UUT is carried out according to the performance test procedure of the electrical equipment to check whether the UUT can provide the performance specified in the normal state of power supply; The duration is not less than 5min to verify that the UUT can continue to work normally under voltage distortion. After the test of one test condition is completed, while slowly increasing the frequency of the superimposed AC component and adjusting the amplitude, the frequency and amplitude of the voltage distortion are observed, Be careful not to exceed the limit of the voltage distortion spectrum until the next test condition is reached.

The same tests were carried out for test conditions A to K in Table LDC103-2.

The voltage, frequency of voltage distortion, amplitude of voltage distortion, duration of distortion and performance results of UUT under each test condition were recorded. The test data recording table was shown in Figure LDC103-3. The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, disconnect the power supply. Turn on the power supply and adjust the voltage to the rated value of 270V, no more superimposed voltage distortion, power supply to UUT; perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

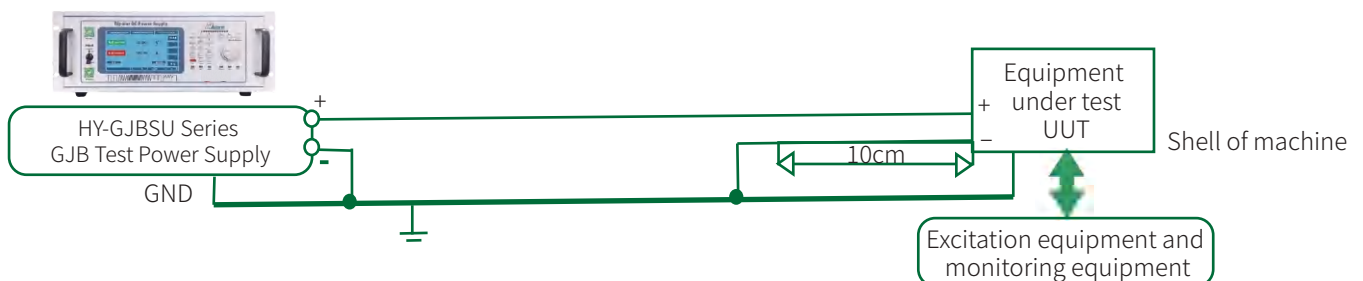


Figure LDC103-1 Typical configuration of voltage distortion spectrum test system 1

Table LDC103-2 Voltage distortion spectrum test conditions

Test condition	Distorted spectrum (Hz)	Amplitude of distortion (Square mean root value) (V)	Duration of time (min)
A	10	0.316	5
B	25	0.500	5
C	50	0.707	5
D	60	0.775	5
E	250	1.581	5
F	1K	3.160	5
G	1.7K	3.160	5
H	2K	3.160	5
I	5K	3.160	5
J	6.5K	2.433	5
K	10K	1.581	5

Note: Considering the influence of the distortion spectrum and the operability of the test method, the distortion spectrum in this test method is only set to 10kHz.

2.6、HDC104 Pulsation

This test is used to verify that when the supply voltage of the DC 270V electrical equipment is pulsating as specified in GJB181B-2012, whether it can work properly and maintain the prescribed performance.

The eligibility criteria are as follows:

Table LDC104-1 Voltage ripple limit

Parameter	Requirement	Corresponding to GJB181B-2012 chapter article number
Voltage pulsation	Max 6V	Table 4

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC104-1. Turn on the power supply and adjust the voltage to the rated value of 270V, the power supply does not output the pulsating component, and supply power to the UUT: Perform the performance test of the UUT to verify that the UUT can provide its specified performance in the normal state of power supply.

Test procedure

Turn on the power supply, set the power supply at the recorded value corresponding to test condition A in the calibration program, adjust the voltage to the rated value 270V, superimpose the set pulsation component, and supply power to the UUT. Perform the performance test on the UUT according to the performance test program of electrical equipment to check whether the UUT can provide the performance specified in the normal power supply state: The duration is not less than 30min to verify that the UUT can continuously work normally under voltage fluctuations.

The above tests were repeated according to test condition B in Table LDC104-2.

Data such as voltage, pulsation spectrum, distortion factor, duration and UUT performance results are recorded for each test condition.

The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, set the power supply to produce no pulsating voltage and adjust the voltage to the rated 270V to supply power to the UUT: Perform a performance test on the UT to confirm that the UUT is not damaged and can provide its specified performance in the normal state of supply.

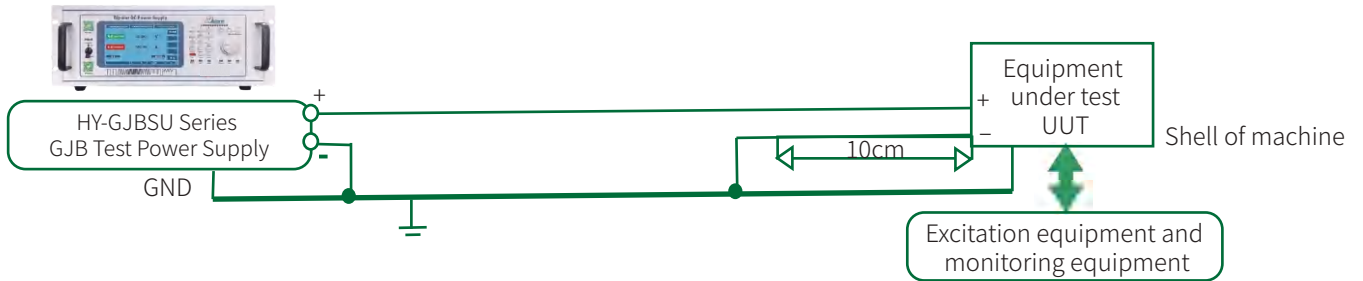


Figure LDC104-1 Typical configuration of pulsation test system

Table LDC104-2 Pulsation test condition

Test condition	Distorted spectrum (Hz)	Amplitude of distortion (Square mean root value) (V)	Duration of time (min)
A	1200	3.16	30
	2400	0.96	
	3600	1.56	
	4800	0.48	
	6000	0.78	
	7200	0.24	
	8400	0.36	
B	2400	3.16	30
	4800	0.96	
	7200	1.56	
	9600	0.48	
	12000	0.78	
	14400	0.24	
	16800	0.36	

2.7、HDC105 Normal voltage transient

This test is used to verify that when the power supply voltage of 270V DC electrical equipment is normal voltage transient specified in GJB181B-2012, whether it can work properly and maintain the prescribed performance.

The eligibility criteria are as follows:

Parameter		Power supply conversion interruption limit requirements (Typical value)		Corresponding to GJB181B-2012 chapter article number
		Transient voltage (V)	Transient voltage duration (S)	
Current distortion spectrum	Upper limit	330	0.020	Figure 15
		280	0.040	
	Lower limit	200	0.010	
		250	0.040	

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC105-1. Turn on the power supply and adjust the voltage to the rated value of 270V to supply power to the UUT; the performance of the UUT is tested to verify that the UUT can provide the performance specified in its normal state of power supply.

Normal voltage transient test procedure

Table LDC105-2 lists the voltage transients that the UUT is subject to under test conditions A~R. Within 1ms, the voltage should increase or decrease from the steady-state voltage to the transient voltage shown in Table LDC105-2. The duration of the transient voltage is shown in Table LDC105-2, after which the voltage should return to the steady state value according to the recovery time listed in the table. For the test conditions E and J, the 330V overvoltage transient duration is 10ms, each interval is 0.5s, three times. For the test conditions M and P, the 200V undervoltage transient duration is 10ms, each interval is 0.5s, and three times. For test conditions Q and R, the 200V undervoltage transient has a duration of 10ms, followed by the 330V overvoltage transient with a duration of 12.5ms, and then the voltage returns to the steady-state value. For each test condition, during each voltage transient and after the voltage returns to the normal steady-state range, the performance test of the UUT is carried out according to the performance test procedure of the electrical equipment to check whether the UUT can provide and maintain the performance specified in the normal state of power supply.

Each test condition was repeated 5 times.

Record the voltage, transient voltage, transient voltage duration, voltage transient (oscilloscope waveform) and UUT performance results under each test condition. See Figure LDC105-2 for the test data recording table.

The test was repeated in various operating modes of UUT.

Repetitive transient test procedure

The power supply provides a continuous repeatable voltage transient, with the UUT input voltage dropping linearly from 270V to 215V in 2.5ms, then increasing linearly to 315V in 30ms, and then decreasing linearly to 270V in 2.5ms. This voltage transient is repeated every 0.5s, as shown in Figure LDC105-3. Perform the performance test of UUT according to the performance test procedure of electrical equipment to check whether the UUT can provide and maintain the specified performance in the normal state of power supply; The duration is not less than 30min to verify that the UUT can operate continuously and normally when subjected to repetitive voltage transients.

Data such as voltage, voltage transient (oscilloscope waveform), transient voltage duration and UUT performance results are recorded.

The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, the power supply voltage is adjusted to the rated value of 270V to supply power to the UUT: Perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

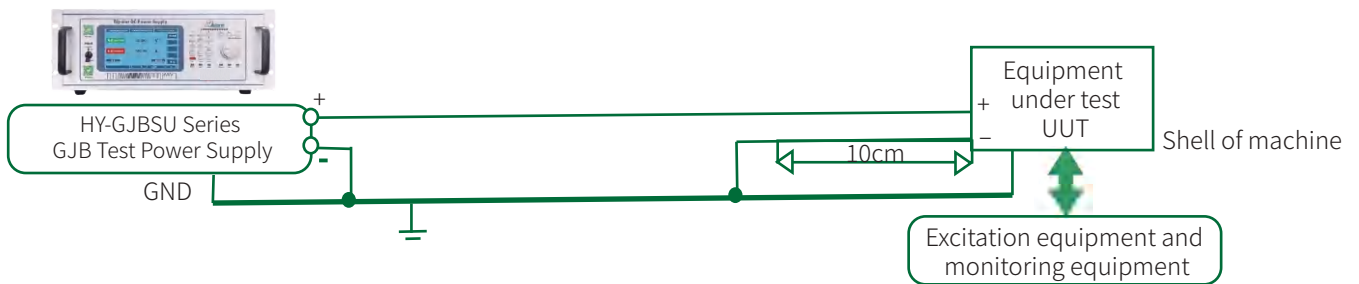


Figure LDC105-1 Typical configuration of normal voltage transient test system

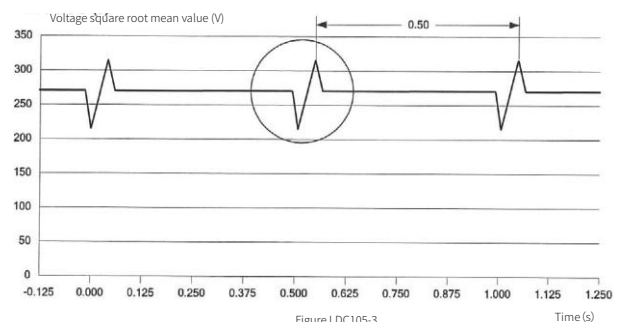
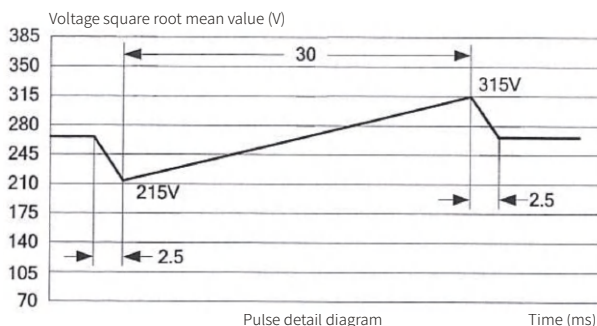


Figure LDC105-3

Table LDC105-2 Normal voltage transient test conditions

Test condition	Steady-state voltage (V)	Time from steady-state voltage to transient voltage (ms)	Transient voltage (V)	Transient voltage duration (ms)	The time from the transient voltage to the steady state voltage or the next transient voltage
Overvoltage transients					
A	280	<1	330	20	<1
B	280	<1	330	20	20
C	280	<1	305	30	<1
D	280	<1	305	30	10
E	280	<1	330 (3 times)	10 (Each interval is 0.5s)	<1
F	250	<1	330	20	<1
G	250	<1	330	20	32
H	250	<1	305	30	<1
I	250	<1	305	30	22
J	250	<1	330 (3 times)	10 (Each interval is 0.5s)	<1
Under-voltage transients					
K	280	<1	200	10	<1
L	280	<1	200	10	48
M	280	<1	200 (3 times)	10 (Each interval is 0.5s)	<1
N	250	<1	200	10	<1
O	250	<1	200	10	30
P	250	<1	200 (3 times)	10 (Each interval is 0.5s)	<1
Mixed transient					
Q	280之后	<1 <1	200 330	10 20	<1 20
R	250之后	<1 <1	200 330	10 20	<1 32
Repeated transient					
S	270	<2.5 <30	215 315	—a —b	— <2.5
a Voltage gradually increases b Voltage gradually decreases					

2.8、HDC201 Interruption of power supply conversion

This test is used to verify that when the power supply voltage of the DC 270V electrical equipment is interrupted by the power supply conversion specified in GJB181B-2012, whether it can function properly and maintain its prescribed performance.

The eligibility criteria are as follows:

Table LDC201-1 Interruption limit of power supply conversion		
Parameter	Requirement	Corresponding to GJB181B-2012 chapter article number
Duration of power supply interruption	50ms	5.1
Lower limit of Normal steady State Voltage(NLSS) voltage	250V	Table 4
Upper normal steady state voltage (NHSS) voltage	280V	

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC201-1. Turn on the power and adjust the voltage to the rated value of 270V to supply power to the UUT: The performance of the UUT is tested to verify that the UUT can provide its specified performance in the normal state of the power supply.

Test procedure

Adjust the voltage setting according to the test conditions A~K in Table LDC201-2, and perform a power supply conversion interruption (0V) according to the duration listed in Table LDC201-2. The UUT input voltage should drop from the steady state value to 0V within 0.25ms, the duration is shown in Table LDC201-2, and then the voltage should return from 0V to the steady state value within 0.25ms. For test condition J, three 50ms power supply interruption tests should be carried out, with each interval of 0.5s. For test condition K, there is a 330V continuous 20ms after power supply interruption. The normal overvoltage transient test is then returned to the steady-state value within 20ms. For test condition L, there is a 200V continuous 10ms after power supply interruption. The normal overvoltage transient test is then returned to the steady-state value within 30ms. For each test condition, the performance test of the UUT is carried out according to the performance test procedure of the electrical equipment to check whether the UUT can provide the performance specified in the power supply conversion state: After the power supply is restored to the normal steady-state range, the UUT performance is tested again to verify that the UUT can provide its specified performance in the normal state of power supply.

Each test condition was repeated five times.

Data such as the steady-state voltage, the duration of the supply interruption and the performance results of the UUT were recorded for each test condition.

The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, the power supply voltage is adjusted to the rated value of 270V to supply power to the UUT: Perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

Table LDC201-2 Interruption limit of power supply conversion		
Test condition	Voltage (V)	Duration of time (ms)
A	270V	50
B	250V	50
C	280V	50
D	270V	30
E	250V	30
F	280V	30
G	270V	10
H	250V	10
I	280V	10
J	270V	50 (Perform three times, each interval of 0.5s)
K	270V	50 (This is followed by a normal overvoltage transient of 330V, lasting 20ms, and then returning to the steady state value within 20ms)
L	270V	50 (This is followed by a normal overvoltage transient of 200V, lasting 10ms, and then returning to the steady state value within 30ms)

2.9、HDC301 Abnormal steady-state voltage

This test is used to verify that when the power supply voltage of the DC 270V electrical equipment appears the abnormal steady-state voltage limit specified in GJB181B-2012, whether it can function properly and maintain its prescribed performance. The eligibility criteria are as follows:

Table LDC301-1 Abnormal steady state voltage limit		
Parameter	Requirement	Corresponding to GJB181B-2012 chapter article number
Abnormal stable voltage lower limit (ALSS) voltage	240V	Figure 17
Abnormal stable voltage upper limit (AHSS) voltage	290V	

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC301-1. Turn on the power and adjust the voltage to the rated value of 270V to supply power to the UUT: The performance of the UUT is tested to verify that the UUT can provide its specified performance in the normal state of the power supply.

Test procedure

Adjust the power supply voltage according to test conditions A and B in Table LDC301-2 respectively to supply power to the UUT. Under each test condition, power off the UUT and power it on again to check whether the UUT can be restarted. After restart, perform performance test on the UUT according to the performance test procedure of the electrical equipment to check whether the UUT can provide the performance specified in the abnormal state of power supply, with a duration of not less than 30min. Adjust the power supply voltage to the rated value of 270V, perform the performance test of the UUT according to the performance test procedure of the electrical equipment, to confirm that the UUT can automatically restore its performance specified in the normal state of power supply and is not damaged.

Data such as voltage, duration, whether the restart is successful and UUT performance results were recorded for each test condition.

The test was repeated in various LDC operating modes of UUT.

Post-test inspection

After all the above tests are completed, the power supply voltage is adjusted to the rated value of 270V to supply power to the UUT: Perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

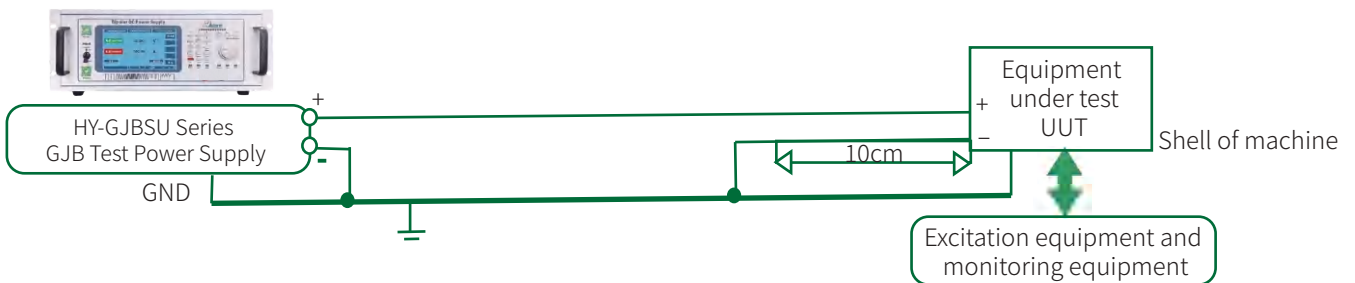


Figure LDC301-1 Abnormal steady-state voltage test conditions

Table LDC301-2 Abnormal steady-state voltage test conditions	
Test condition	Voltage (V)
A	240V
B	290V

3.0、HDC302 Abnormal voltage transient

This test is used to verify that when the power supply voltage of 270V DC electrical equipment appears abnormal stable voltage transient specified in GJB181B-2012, whether it can function properly and maintain its prescribed performance. The eligibility criteria are as follows:

Table LDC302-1 Transient limit of abnormal voltage				
Parameter		Requirement (Typical value)		Corresponding to GJB181B-2012 chapter article number
		Transient voltage (V)	Transient voltage duration (S)	
Abnormal voltage transient	overvoltage	350	<0.05	Figure 17
		$289.6+3.02/t$	0.05~7.55	
	290	>7.55		
	undervoltage	0	7	—

Note: The undervoltage limit curve (0V, 7s) in FIG. 17 of GJB 181B-2012 is an extreme case of abnormal voltage transient of the aircraft power supply system, that is, power supply failure, and should not be used as a qualified criterion for this test project.

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC302-1. Turn on the power and adjust the voltage to the rated value of 270V to supply power to the UUT: The performance of the UUT is tested to verify that the UUT can provide its specified performance in the normal state of the power supply.

Test procedure

Table LDC302-2 specifies the voltage that the UUT should withstand under each test condition A~N. The transient input voltage should rise or fall from the steady-state voltage to the transient voltage within 1ms, its duration is shown in LDC302-2, and then the voltage returns to the steady-state value according to the time listed in the table.

For test conditions C and F, the 350V overvoltage transient duration is 50ms, each interval is 0.5s, three times. For test conditions I and L, the duration of 180V undervoltage transients is 50ms, each interval is 0.5s. Do it three times. For test conditions M and N, a 180V undervoltage transient with a duration of 10ms is immediately followed by a 350V overvoltage transient with a duration of 50ms, and finally the voltage returns to the steady state value. For each test condition, during the voltage transient period, the performance of the UUT was monitored according to the electrical equipment performance test procedure to check whether the UUT could provide its specified performance in the abnormal state of power supply. Each test condition was repeated 5 times. After the power supply is restored to the normal steady-state range, the UUT is tested to verify that the UUT can automatically restore its performance as specified in the normal state of power supply.

Record the steady-state voltage, transient voltage, transient voltage duration, voltage transient (oscilloscope waveform) and UUT performance results under each test condition.

The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, the power supply voltage is adjusted to the rated value of 270V to supply power to the UUT: Perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

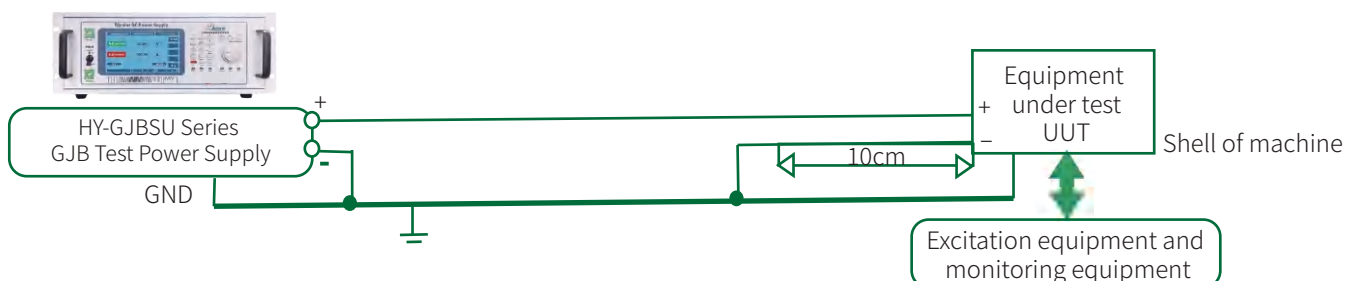


Figure LDC302-1 Typical configuration of non-normal voltage transient test system

Table LDC302-2 Abnormal voltage transient test conditions

Test condition	Steady-state voltage (V)	Time from steady-state voltage to transient voltage (ms)	Transient voltage (V)	Transient voltage duration (ms)	The time from the transient voltage to the steady state voltage or the next transient voltage
Overtoltage transients					
A	280	<1	350	50	<1ms
B	280	<1	350	50	10ms
		—	340	—a	15ms
		—	330	—a	25ms
		—	32	—a	190ms
		—	300	—a	1.71s
		—	280	—	—
C	280	<1	350 (3 times)	50 (Each interval is 0.5s)	<1ms
D	250	<1	350	50	<1ms
E	25	<1	350	50	10ms
		—	340	—a	15ms
		—	330	—a	25ms
		—	320	—a	190ms
		—	300	—a	6.7s
		—	250	—	—
F	250	<1	350 (3 times)	50 (Each interval is 0.5s)	<1ms
Under-voltage transients					
G	280	<1	180	50	<1ms
H	280	<1	180	50	10ms
		—	190	—b	15ms
		—	200	—b	25ms
		—	210	—b	190ms
		—	230	—b	6.7s
		—	280	—	—

Table LDC302-2 Abnormal voltage transient test conditions

Test condition	Steady-state voltage (V)	Time from steady-state voltage to transient voltage (ms)	Transient voltage (V)	Transient voltage duration (ms)	The time from the transient voltage to the steady state voltage or the next transient voltage
Undervoltage transient					
I	280	<1	180 (3 times)	50 (Each interval is 0.5s)	<1ms
J	250	<1	180	50	<1ms
k	250	<1	180	50	10ms
		—	190	—b	15ms
		—	200	—b	25ms
		—	210	—b	190ms
		—	230	—b	1.71s
		—	250	—	—
L	250	<1	180 (3 times)	50 (Each interval is 0.5s)	<1ms
Mixed transient					
M	280	<1	180	10	<1ms
		<1	350	50	10ms
		—	340	—a	15ms
		—	330	—a	25ms
		—	320	—a	190ms
		—	300	—a	1.71s
N	250	<1	180	10	<1ms
		<1	350	50	10ms
		—	340	—a	15ms
		—	330	—a	25ms
		—	320	—a	190ms
		—	300	—a	6.7s
—	250	—	—		
a Voltage gradually increases b Voltage gradually decreases					

3.1、HDC401 Emergency steady-state voltage

This test is used to verify that when the supply voltage of the DC 270V electrical equipment appears the emergency steady-state voltage limit specified in GJB181B-2012, whether it can function properly and maintain its prescribed performance.

The eligibility criteria are as follows:

Table LDC401-1 Emergency steady-state voltage and frequency limits		
Parameter	Requirement	Corresponding to GJB181B-2012 chapter article number
Emergency steady State Voltage Lower limit (ELSS) voltage	250V	Table 4
Emergency stable voltage Upper limit (EHSS) voltage	280V	

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC401-1. Turn on the power and adjust the voltage to the rated value of 270V to supply power to the UUT: The performance of the UUT is tested to verify that the UUT can provide its specified performance in the normal state of the power supply.

Test procedure

Adjust the power supply voltage according to the test conditions A and B in Table LDC401-2 respectively to supply power to the UUT. Under each test condition, power off the UUT and then power it on again to check whether the UUT can be restarted. After restart, perform performance test on the UUT according to the performance test procedure of the electrical equipment to check whether the UUT can provide the performance specified in the emergency power supply state: the duration is not less than 30min, so as to verify that the UUT can continuously work normally under the emergency steady-state voltage limit.

Adjust the power supply voltage to the rated value of 270V, perform the performance test of the UUT according to the performance test procedure of the electrical equipment, to confirm that the UUT can automatically restore its performance specified in the normal state of power supply and is not damaged.

Data such as voltage, duration, whether the restart is successful and UUT performance results were recorded for each test condition.

The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, the power supply voltage is adjusted to the rated value of 270V to supply power to the UUT: Perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

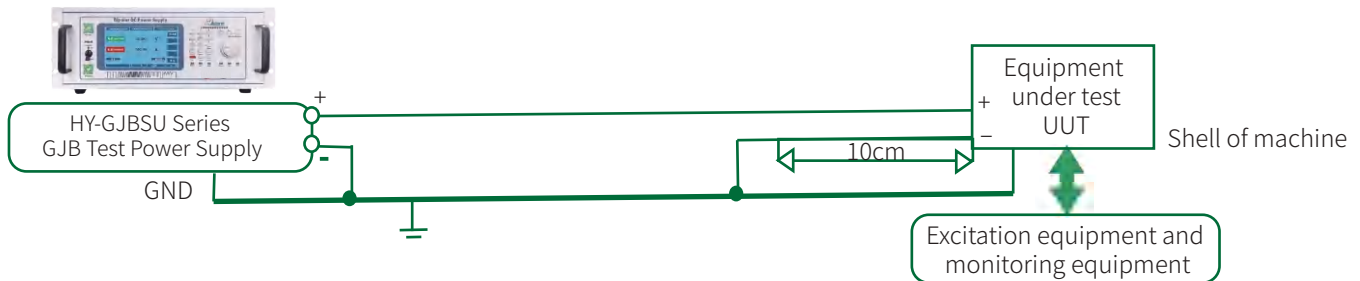


Figure LDC401-1 Typical configuration of emergency steady-state voltage test system

Table LDC401-2 Emergency steady-state voltage test conditions		
Test condition	Voltage (V)	Duration of time (min)
A	250V	30
B	280V	30

3.2、HDC501 Starting voltage transient

This test is used to verify that when the supply voltage of DC 270V electrical equipment is the starting voltage transient specified in GJB181B-2012, whether it can work properly and maintain the prescribed performance. The eligibility criteria are as follows:

Table LDC501-1 Transient limit of starting voltage		
Parameter	Requirement	Corresponding to GJB181B-2012 chapter article number
Starting voltage transient	115V~280V	—

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC501-1. Turn on the power and adjust the voltage to the rated value of 270V to supply power to the UUT: The performance of the UUT is tested to verify that the UUT can provide its specified performance in the normal state of the power supply.

Test procedure

The UUT shall withstand the starting voltage transients specified in Table LDC501-2, in which the input voltage decreases from the steady-state value to 115V within 1ms and then increases to the steady-state value at a constant rate within 30s. During each start-up voltage transient, the performance of the UUT was tested according to the electrical equipment performance test procedure to check whether the UUT could provide its specified performance in the electrical start-up state. Repeat five times.

Record steady-state voltage, transient voltage, recovery time, voltage transient (oscilloscope waveform) and UUT performance results.

After the power supply is restored to the normal steady state range, the UUT performance test is carried out to verify that the UUT can automatically restore its performance specified in the normal state of power supply.

The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, the power supply voltage is adjusted to the rated value of 270V to supply power to the UUT: Perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

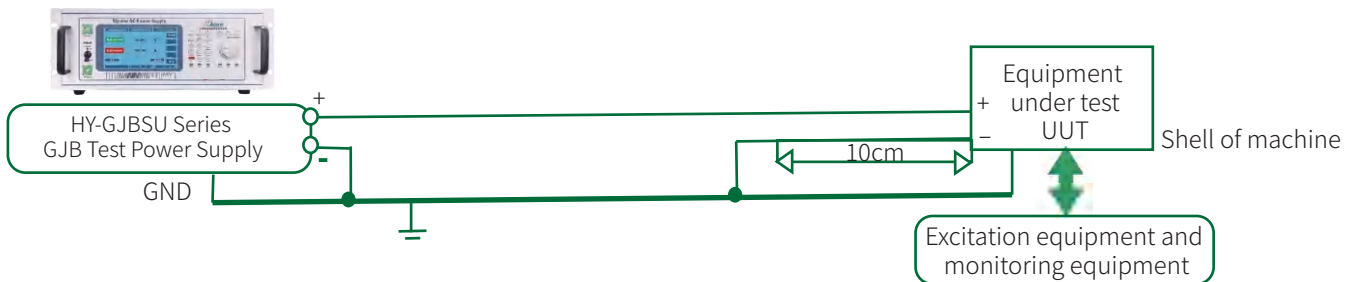


Figure LDC501-1 Typical configuration of starting voltage transient test system

Table LDC501-2 Starting voltage transient test conditions				
Test condition	Steady-state voltage (V)	Time from steady-state voltage to transient voltage (ms)	Transient voltage	The time from the transient voltage to the steady state voltage or the next transient voltage (ms)
A	280V	<1ms	115V	30s

3.3、HDC601 Power failure

This test is used to verify that when the power supply voltage of the DC 270V electrical equipment is cut off according to GJB181B-2012, whether it can work properly and maintain the prescribed performance.

The eligibility criteria are as follows:

Table LDC601-1 Power off limit		
Parameter	Requirement	Corresponding to GJB181B-2012 chapter article number
Power failure	7s	Figure 17

Test method

Pretest inspection

Disconnect the power supply and refer to Figure LDC601-1 to install the UUT and HY-GJB series test power supply. Turn on the power and adjust the voltage to the rated value of 270V to supply power to the UUT: The performance of the UUT is tested to verify that the UUT can provide its specified performance in the normal state of the power supply.

Test procedure

The blackout (0V) test was performed according to the duration listed in Table LDC601-2 for each test condition A to D. The UUT input voltage should drop from the steady state voltage to 0V within 0.25ms. The duration of holding 0V is shown in Table LDC601-2, and then the voltage returns from 0V to the steady state value at 0.25ms. For each test condition, the performance test of the UUT is carried out according to the performance test procedure of the electrical equipment to check whether the UUT can provide its specified performance in the condition of power supply failure. After the power supply is restored to the normal steady state range, the performance test of the UUT is carried out according to the performance test procedure of the electrical equipment. To verify that the UUT can automatically recover to its specified performance in the normal state of power supply and is not damaged.

Data such as voltage, outage duration and UUT performance results are recorded for each test condition.

Each test condition was repeated 5 times.

The test was repeated in various operating modes of UUT.

Post-test inspection

After all the above tests are completed, the power supply voltage is adjusted to the rated value of 270V to supply power to the UUT: Perform a performance test on the UUT to confirm that the UUT is not damaged and can provide the performance required under normal power supply.

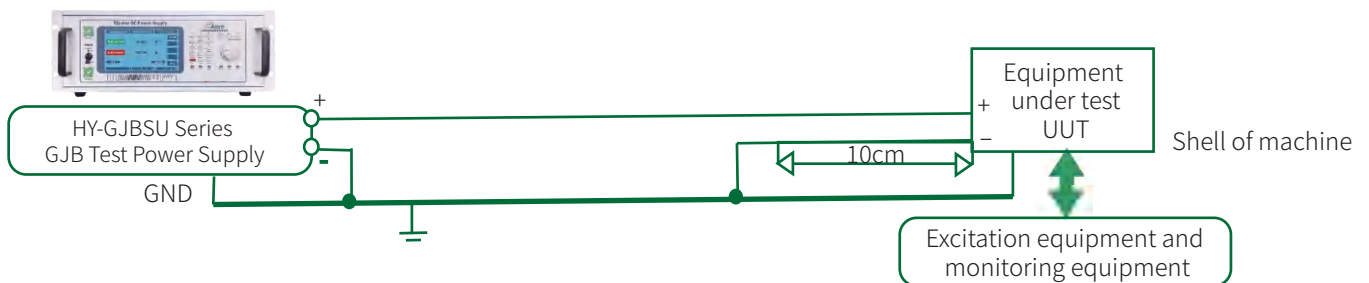


Figure LDC601-1 Typical configuration of power failure test system

Table LDC601-2 Power off test condition	
Test condition	Voltage (V)
A	100ms
B	500ms
C	3s
D	7s

3.4、HDC602 Reverse polarity

This test is used to verify that the DC 270V electrical equipment will not be damaged when the supply voltage is reversed polarity, or take effective physical measures to prevent the occurrence of reverse polarity.
The eligibility criteria are as follows:

Table LDC602-1 Reverse polarity fault		
Parameter	Requirement	Corresponding to GJB181B-2012 chapter article number
Reverse polarity fault	The DC equipment should not be damaged due to the reverse connection of positive and negative lines. To prevent input polarity or phase sequence reversal, this requirement can be achieved using proven physical methods.	5.4.6

Test method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supply according to Figure LDC602-1. Turn on the power and adjust the voltage to the rated value of 270V to supply power to the UUT: The performance of the UUT is tested to verify that the UUT can provide its specified performance in the normal state of the power supply.

Test procedure

Consistency check

If effective physical measures have been taken to prevent the occurrence of reverse polarity, the effectiveness of such measures should be verified to confirm that positive and negative lines cannot be reversed.

If the positive and negative lines may be reversed or the measures taken are ineffective, the following tests are performed.

Test procedure

Disconnect the power supply and refer to Figure LDC602 1-2 (positive and negative polarity connection) to install the UUT, excitation equipment and monitoring equipment (When the test power supply can produce negative polarity output, still connect according to Figure LDC602-1, the test power supply can be set to negative voltage output). Turn on the power supply and adjust the voltage to the rated value of 270V to supply power to the UUT; When the power input is in reverse polarity state, keep the power supply for at least 30 minutes to verify that the UUT will not be damaged or cause unsafe state due to the power input wire connection.

Data such as steady-state voltage, reverse polarity duration and UUT performance results are recorded.

The test was repeated in various operating modes of UUT.

Post-test inspection

Disconnect the power supply and install the UUT, excitation equipment and monitoring equipment according to Figure LDC602-1 (positive and negative lines are correctly connected). Turn on the power supply and adjust the voltage to the rated value of 270V, supply power to the UUT to ensure that the UUT has not been damaged or caused an unsafe condition due to the reverse polarity of the supply, maintain power supply at least 30mn: Perform performance tests on the UUT according to the electrical equipment performance test procedure to confirm that the UUT has recovered its performance as specified in the normal state of power supply and is not damaged.

Record steady-state voltage, duration of test conditions and UUT performance results. See Figure LDC602-3 for the test data records.

The above tests were repeated in various operating modes of UUT.

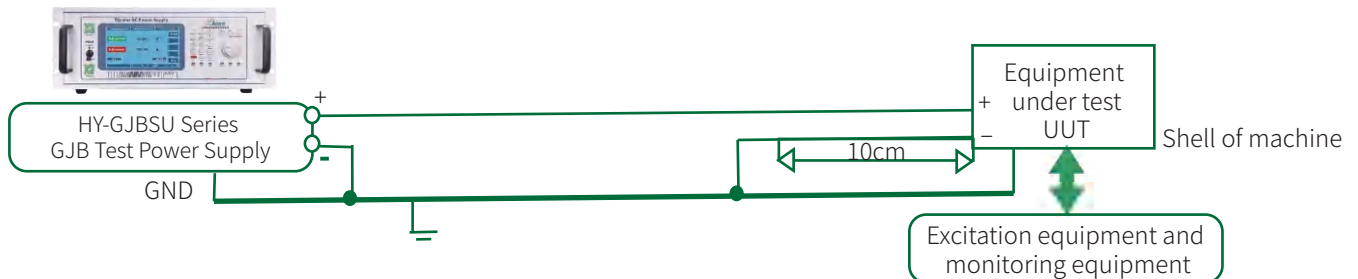


Figure LDC602-1 Typical configuration of polarity correct connection test system

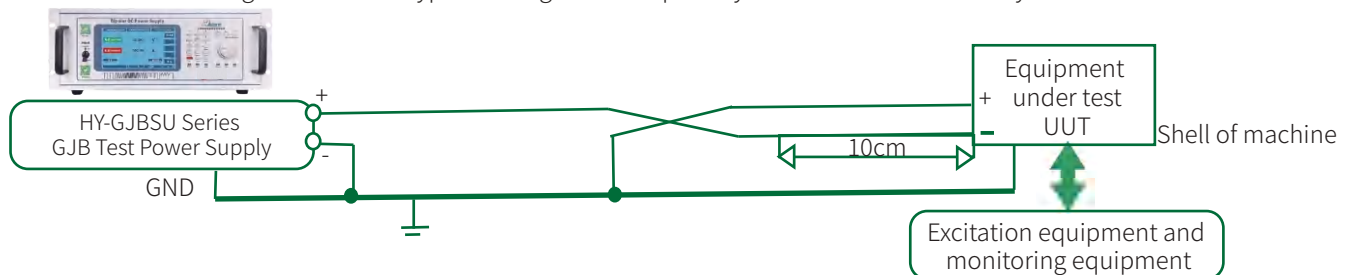
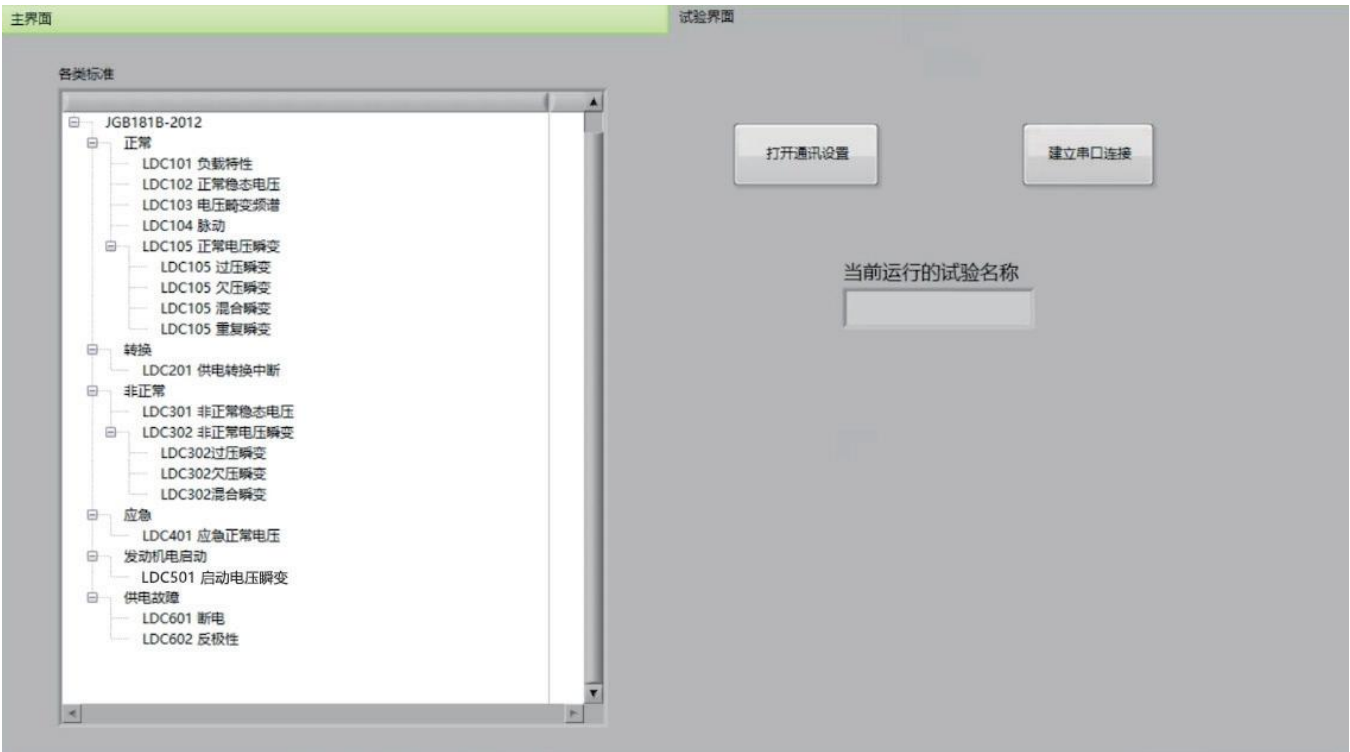


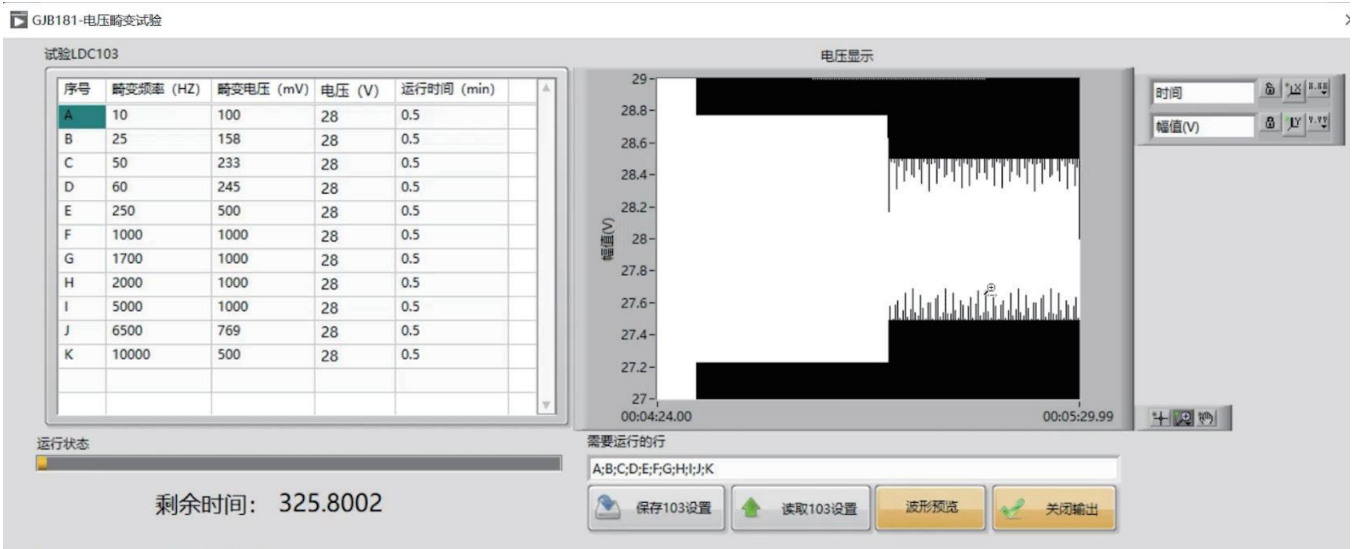
Figure LDC602-2 Typical configuration of reverse polarity connection test system

Description Of The Upper Computer

Self-equipped upper computer software, built-in GJB181B-2012 aircraft power supply characteristics standard DC 28V test all items, entries are clear. Directly click on the test item to open the special page. The default value within each test item is the standard value. Customers can also click the panel to modify the value according to their own needs.



Upper computer software homepage



LDC103 test interface demonstration

Upper Computer Software Display

GJB181-正常电压瞬变试验

试验LDC105——过电压瞬变

试验序号	稳态电压 (V)	持续时间 (s)	稳态至瞬态时间(ms)	瞬变电压 (V)	保持时间 (ms)	恢复时间(ms)
A	29	5	1	50	12.5	1
B	29	5	1	50	12.5	70
C	29	5	1	40	45	1
D	29	5	1	40	45	37.5
E1	29	5	1	50	10	1
E2	29	0.5	1	50	10	1
E3	29	0.5	1	50	10	1
F	22	5	1	50	12.5	1
G	22	5	1	50	12.5	93
H	22	5	1	40	45	1
I	22	5	1	40	45	60
J1	22	5	1	50	10	1
J2	22	0.5	1	50	10	1
J3	22	0.5	1	50	10	1

运行状态

过电压瞬变剩余循环次数: 5 次

过电压瞬变循环次数: 5 次

试验结束后电压: 22 V

当前运行的行: A

需要运行的行: A;B;C;D;E1;E2;E3;F;G;H;I;J1;J2;J3

电压显示

读取瞬变设置

保存瞬变设置

波形预览

关闭瞬变

LDC105 test interface demonstration

GJB181-供电转换中断界面

试验LDC201——供电中断循环

序号	特性	稳态电压 (V)	持续时间 (s)	稳态至瞬态持续时间 (ms)	瞬变电压 (V)	保持时间 (ms)	恢复时间(ms)
A	供电中断	28	5	0.2	0	50	0.2
B	供电中断	22	5	0.2	0	50	0.2
C	供电中断	29	5	0.2	0	50	0.2
D	供电中断	28	5	0.2	0	50	0.2
E	供电中断	22	5	0.2	0	50	0.2
F	供电中断	29	5	0.2	0	50	0.2
G	供电中断	28	5	0.2	0	50	0.2
H	供电中断	22	5	0.2	0	50	0.2
I	供电中断	29	5	0.2	0	50	0.2
J1	供电中断	28	5	0.2	0	50	0.2
J2	供电中断	28	0.5	0.2	0	50	0.2
J3	供电中断	28	0.5	0.2	0	50	0.2
K1	供电中断	28	5	0.2	0	50	0.2
K2	瞬变电压	28	0.001	1	50	12.5	70
L1	供电中断	28	5	0.2	0	50	0.2
L2	瞬变电压	28	0.001	1	18	15	85

运行状态

供电中断剩余循环次数: 0 次

供电中断循环次数: 5 次

试验结束后电压: 28 V

当前运行的行: A

需要运行的行: A;B;C;D;E;F;G;H;I;J1;J2;J3;K1;K2;L1;L2

电压显示

读取201设置

保存201设置

波形预览

启动LDC201

LDC201 test interface demonstration

GJB181-启动电压瞬变界面

电压显示

时间: 00:00:00.00

幅值(V): 0

启动电压瞬变
剩余循环时间:
140.8 秒

循环次数:
5 次

结束电压值:
28 V

运行状态

试验序号	稳态电压 (V)	持续时间 (s)	稳态至瞬态时间(ms)	瞬变电压 (V)	保持时间(ms)	恢复时间(s)
A	29	5	1	50	12.5	30

试验LDC501——启动电压瞬变

波形预览

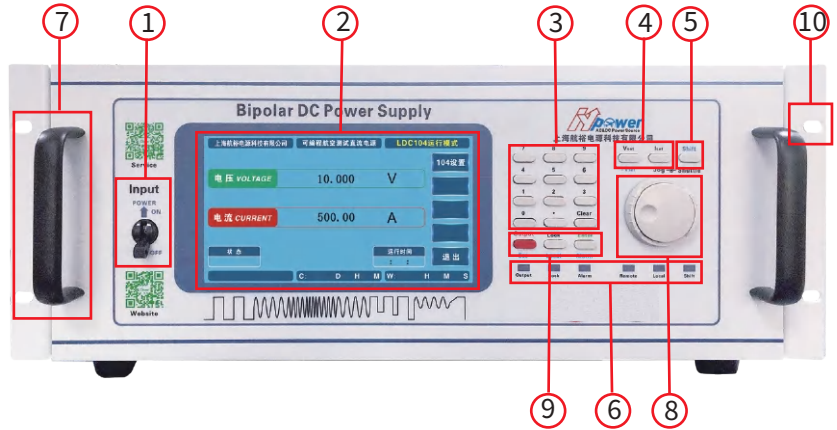
启动瞬变

LDC501 test interface demonstration

7 Inches Large LCD Display

Control Panel Description

- 1、 Power input circuit breaker;
- 2、 7-inch LCD display window display: Voltage and current setting value, Voltage and current measurement value, function setting menu;
- 3、 Function button: for the required value input and parameter setting;
- 4、 Voltage/current setting key
- 5、 Shift function reuse key
- 6、 Status indicator light
- 7、 Case handle
- 8、 Multi-level shuttle adjustment knob, the inner ring adjust one word each time, the outer ring is divided into ± 8 segments adjustable;
- 9、 Lock、 Enter、 Esc、 Local、 Reset、 Alarm、 Output ON/OFF
- 10、 19 inch standard rack mounting holes



Display screen



状态	畸变频率 (Hz)	畸变电压 (mV)	电压 (V)	是否叠加	运行时间
A	10.00	100.00	28.00		: :
B	25.00	158.00	28.00		: :
C	50.00	233.00	28.00		: :
D	60.00	245.00	28.00		: :
E	250.00	500.00	28.00		: :
F	1000.00	1000.00	28.00		: :
G	1700.00	1000.00	28.00		: :
H	2000.00	1000.00	28.00		: :
I	5000.00	1000.00	28.00		: :
J	6500.00	707.00	28.00		: :
K	10000.00	500.00	28.00		: :

运行
保存
退出

状态	畸变频率 (Hz)	畸变电压 (mV)	电压 (V)	是否叠加	运行时间
A	1200.00	800.00	28.00		: :
	2400.00	160.00	28.00		
	3600.00	260.00	28.00		
	4800.00	80.00	28.00		
	6000.00	130.00	28.00		
	7200.00	40.00	28.00		
	8400.00	60.00	28.00		
B	2400.00	800.00	28.00		: :
	4800.00	160.00	28.00		
	7200.00	260.00	28.00		
	9600.00	80.00	28.00		
	12000.00	130.00	28.00		
	14400.00	40.00	28.00		
16800.00	60.00	28.00			

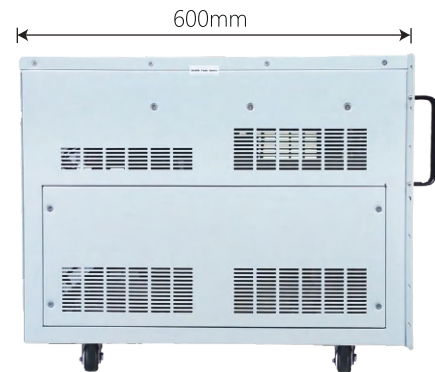
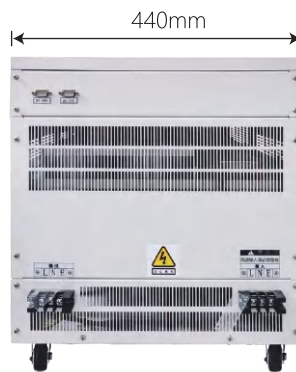
运行
保存
退出

Dimensions Of Appearance

4U 433(W)*560(D)*177(H)mm



10U 440(W)*600(D)*445(H)mm

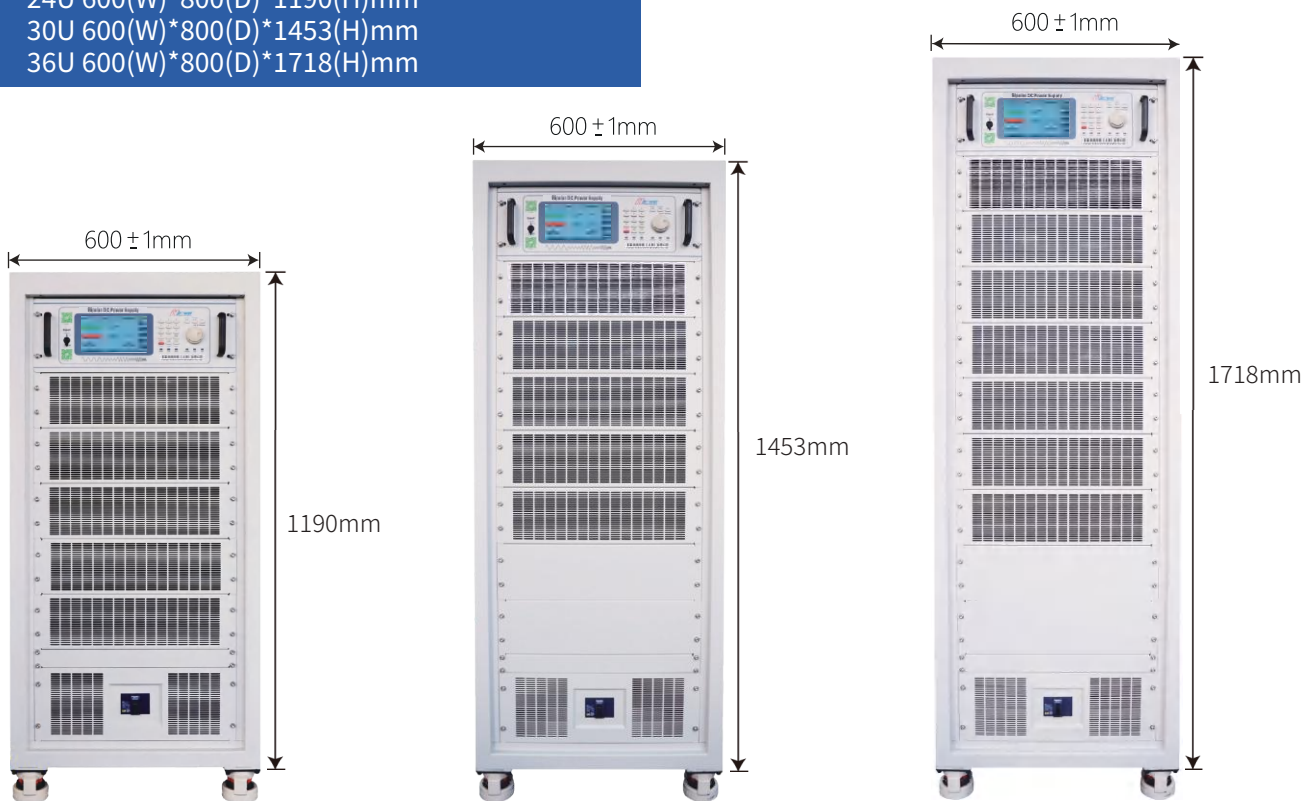


Dimensions Of Appearance

18U 600(W)*800(D)*920(H)mm



24U 600(W)*800(D)*1190(H)mm
30U 600(W)*800(D)*1453(H)mm
36U 600(W)*800(D)*1718(H)mm



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 North Sea Fleet
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All technical data and instructions are based on the actual product

If there is any change, Hangyu Power has the final interpretation right

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