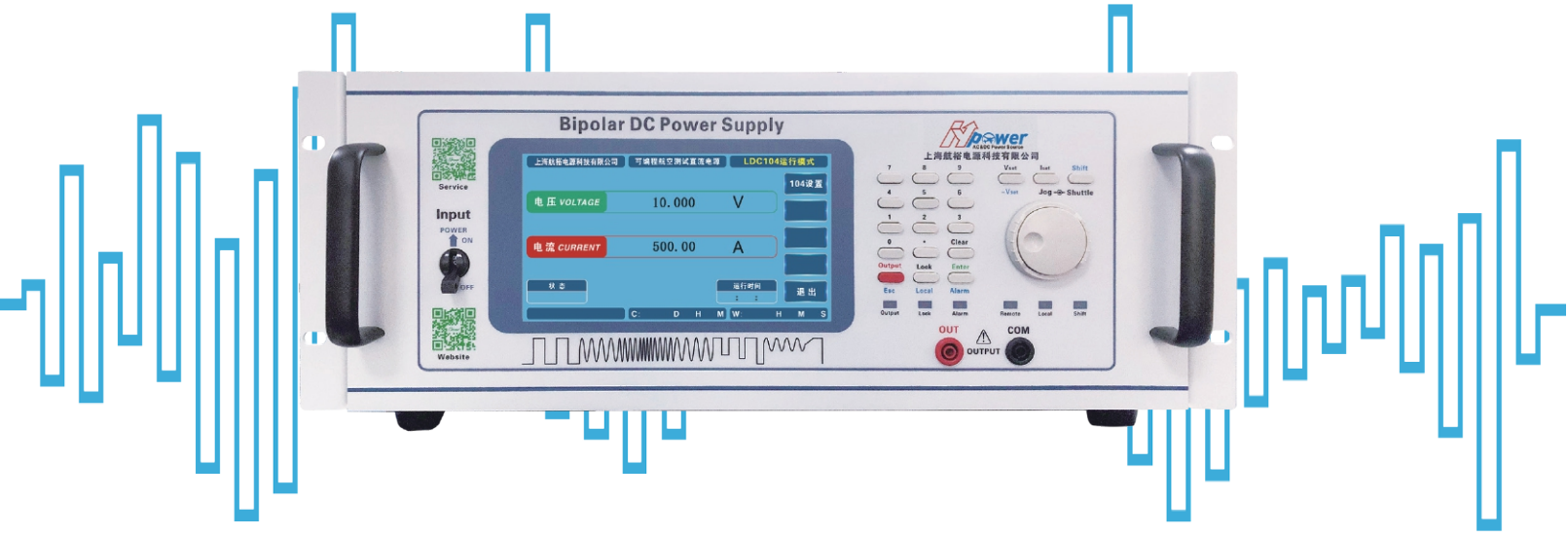
GJB181B-2012Standard for Aircraft Power Supply Characteristics DC 28VTesting Solutions

AC&DC Power Source

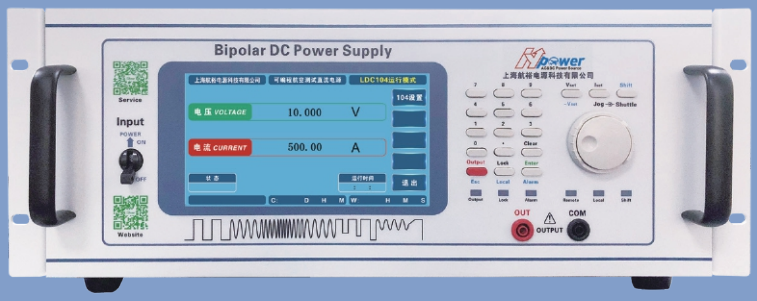


HY-GJB Series Test Power Supply

Broadband

High speed

Large current



Actual measurement demonstration video

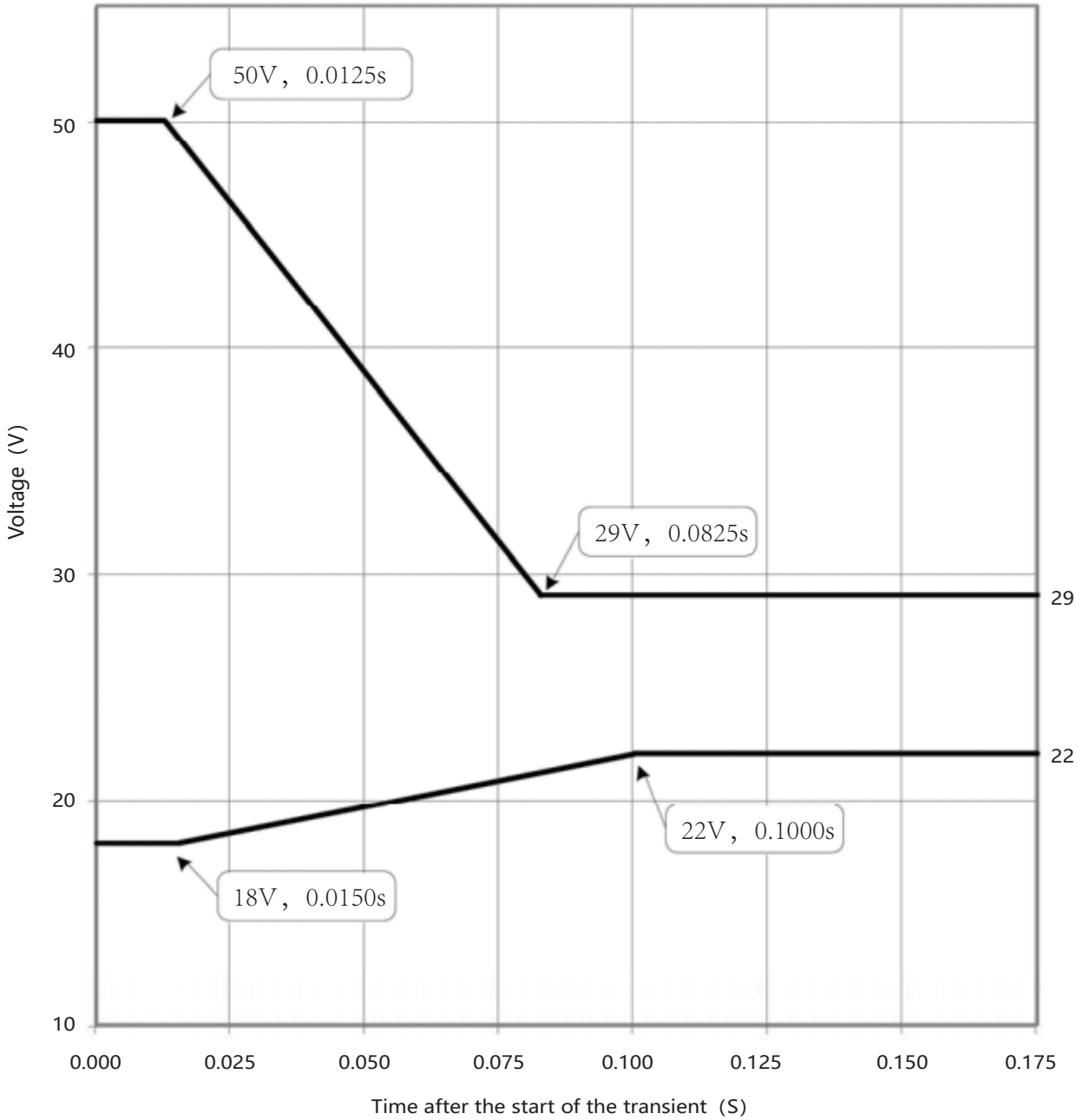
Product Features

- HY-GJB series It is a DC regulated power supply suitable for GJB 181B-2012, 28V Standard Test for Aircraft Power Supply Characteristics。
- It can generate any waveform and set timing control, using "new linear technology" 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: 0-100V
- Output current: 0-500A
- Output power: 200W~10kW
- Low ripple/low noise
- Type of load used: inductive load, capacitive load
- Supports front panel programming without computer software programming
- 7-inch large LCD display screen
- Touch screen operation&number button input&multi-level shuttle adjustment
- Warranty period: three years
- High speed response speed, voltage response time≤10μs

GJB 181B-2012 28VS Tandard Requirements For Power Supply Systems

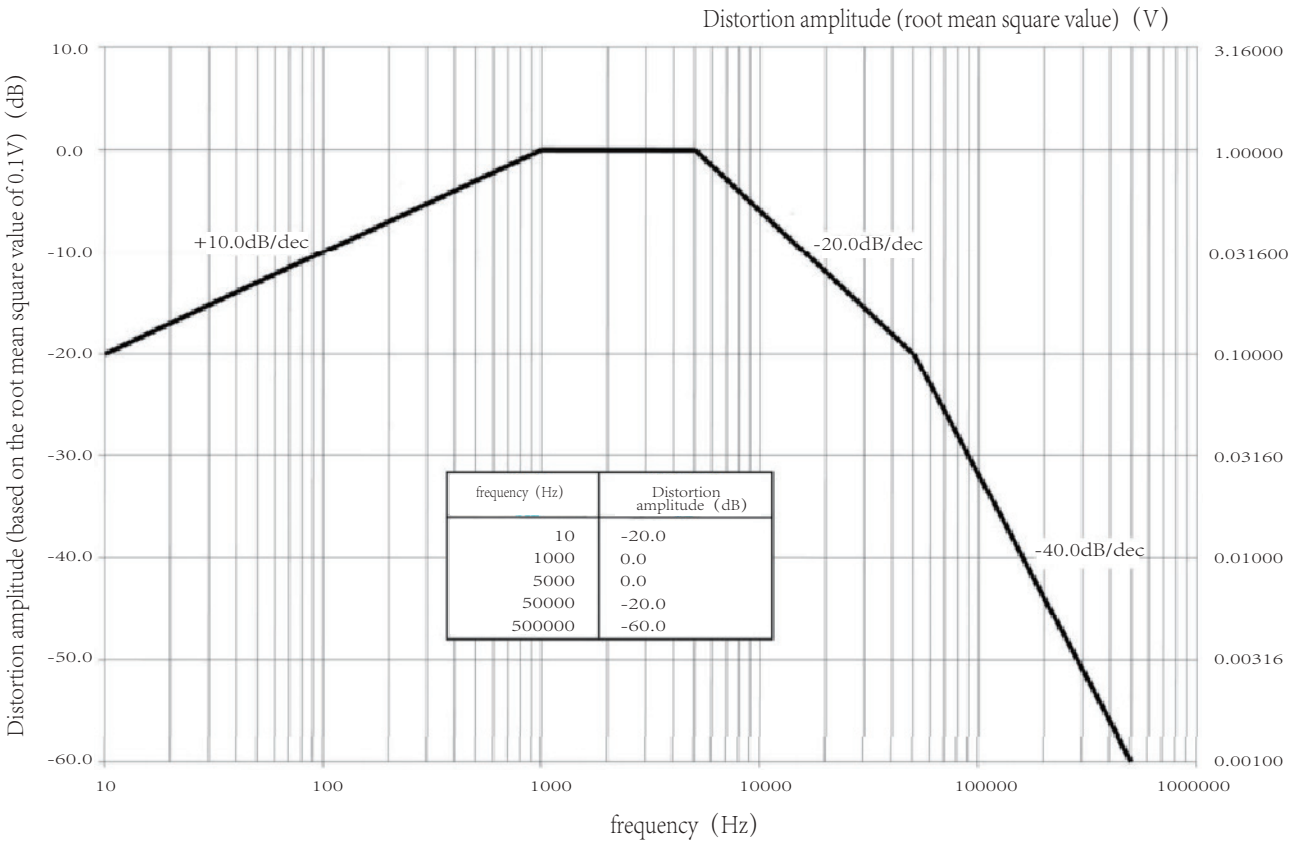
Serial number	Working status of aircraft power supply system	Test item number	Test project name	Whether it meets the requirements	Introduction Page
1	Normal	LDC101	load characteristics	meet with	4
		LDC102	Normal steady-state voltage	meet with	5
		LDC103	Voltage distortion spectrum	meet with	6
		LDC104	Pulsation	meet with	8
		LDC105	Normal voltage transient	meet with	10
2	Convert	LDC201	Power supply conversion interruption	meet with	13
3	Abnormal	LDC301	Abnormal steady-state voltage	meet with	15
		LDC302	Abnormal voltage transient	meet with	16
4	Meet an emergency	LDC401	Emergency normal voltage	meet with	19
5	Engine mechanical and electrical start	LDC501	Starting voltage transient	meet with	20
6	Power failure	LDC601	Outage	meet with	21
		LDC602	Reversed polarity	meet with	22

GJB 181B-2012 Form4 Normal Operating Characteristics Of DC			
Normal operating characteristics		28V DC system	Whether it meets the requirements
Steady state	Steady-state voltage	22.0V~29.0V	meet with
	Distortion coefficient	0.035 maximum	meet with
	Distortion frequency	picture 13	meet with
	Pulsation amplitude	1.5V maximum	meet with
Transient characteristics	Transients	picture 12	meet with

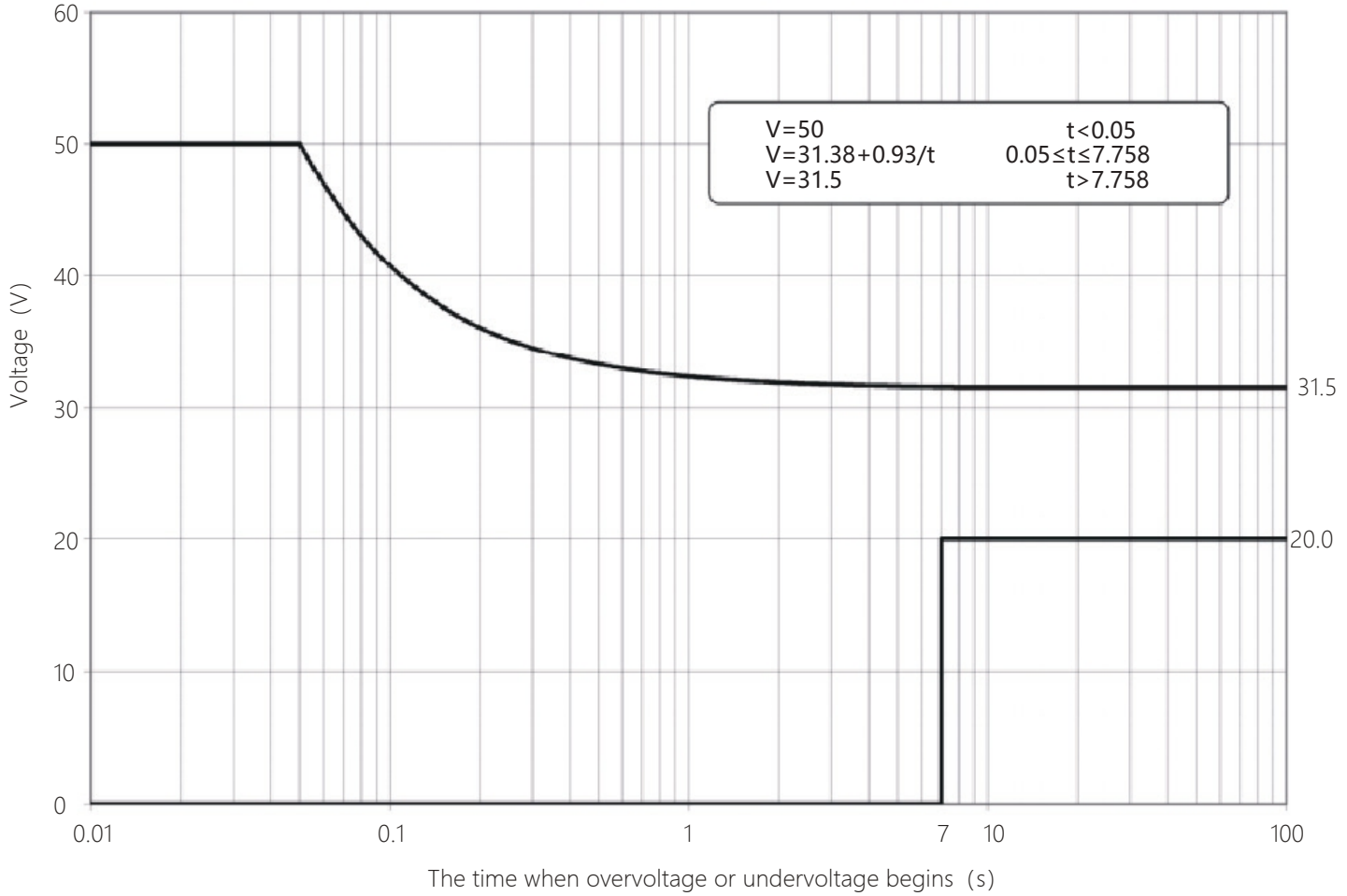


Note: The steady-state limit does not include the disturbances allowed in Table 4。

GJB 181B-2012 Figure 12 Envelope Line Of 28V DC Normal Transient Voltage



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



GJB 181B-2012 Figure 14 28V DC Abnormal Operating Voltage Limits

2.1、LDC101 Load Characteristics

This test is used to verify whether the load characteristics of DC 28V electrical equipment comply with the provisions of GJB181B-2012 and the special specifications for electrical equipment.
The qualification criteria are shown in the table below:

Parameter	Load characteristic requirements	Corresponding to GJB181B-2012Chapter number
Impulse current	Unless otherwise specified, for electrical equipment with a power greater than 200W, the peak impulse current should not exceed 5 times the rated current and return to the rated current within 0.1 seconds	5.4.9
Power tolerance	Not more than 10% of rated input power	5.4.3
Current distortion	All electrical equipment should not introduce excessive current distortion that can affect other equipment	5.4.8
Current spectrum	—	—
Current modulation	Efforts should be made to minimize the current modulation caused by it, and urrent modulation should not cause electrical equipment The relevant power supply characteristic parameters of the terminal exceed the provisions of this standard	5.4.7
Note: The special specifications for electrical equipment can also specify other requirements to reduce the potential adverse effects of electrical equipment on aircraft power supply characteristics, such as current distortion and frequency distortion Spectral limit, current modulation, etc.		

Test Method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supplies according to Figure LDC101-1.

Turn on the power supply and adjust the voltage to the rated value of 28V. According to the special specifications for electrical equipment, conduct the test according to the following methods:

a、Impulse current:

Turn on switch K, control the contactor to turn on, suddenly apply 28V (step) to UUT, and record the power on impulse current. Then, according to the performance test procedure of the electrical equipment, perform the UUT Conduct performance tests to verify that UUT can provide the specified performance under normal power supply conditions before the impact current test is effective. Specific specifications for integrating impulse current with electrical equipment Compare with the specified values of GJB181B-2012 to determine if they meet the requirements。

b、Input power

Like UUT power supply, perform performance testing on UUT according to the performance testing program of electrical equipment, verify that UUT can provide the specified performance under normal power supply conditions, and record it stably State current and voltage; Calculate the input power and compare it with the rated value in the special specifications for electrical equipment to determine whether its power tolerance meets the requirements of GJB181B-2012 Seek.

c、Current distortion

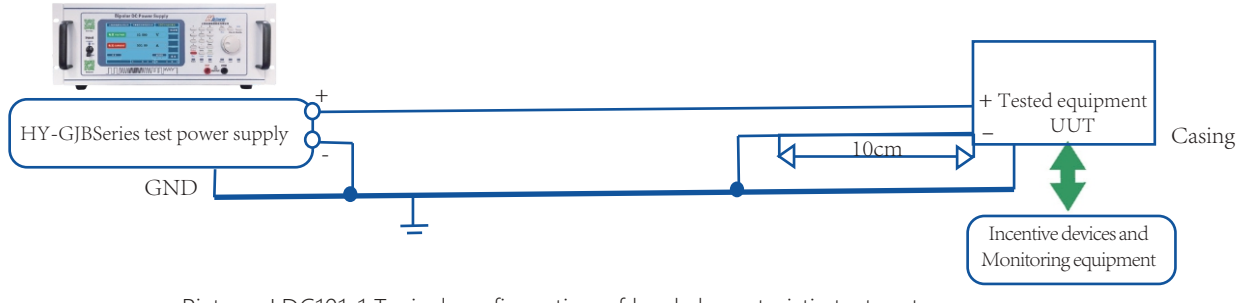
Supply power to the UUT, conduct performance testing on the UUT according to the performance testing program of the electrical equipment, verify that the UUT can provide the performance specified in the normal power supply state, and record the electricity Compare the current distortion coefficient with the specified values in the special specifications for electrical equipment to determine whether the current distortion meets the requirements.

d、Current distortion spectrum

Like UUT power supply, perform performance testing on UUT according to the performance testing program of electrical equipment, verify that UUT can provide the specified performance under normal power supply status, and record the electricity The current distortion spectrum (current amplitude/ frequency) is compared with the rated value in the special specifications for electrical equipment to determine whether the current distortion spectrum meets the requirements.

e、Uurrent modulation

Like UUT power supply, perform performance testing on UUT according to the performance testing program of electrical equipment, verify that UUT can provide the specified performance under normal power supply status, and record the electricity Current modulation and comparison with the rated values in the special specifications for electrical equipment to determine whether current modulation meets the requirements.



Picture LDC101-1 Typical configuration of load characteristic test system

2.2、LDC102 Normal Steady-State Voltage

This test is used to verify whether the DC 28V electrical equipment can operate normally and maintain the specified performance when the power supply voltage is within the normal steady-state range specified in GJB181B-2012. The qualification criteria are shown in the table below:

Normal Steady-State Voltage Limit		
Parameter	Ask	Corresponding to GJB 181B-2012Chapter number
Lower limit of normal steady-state voltage (NLSS) voltage	22 V	form 4
Upper limit of normal steady-state voltage (NHSS) voltage	29 V	

Test Method

Pre experimental testing

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

Turn on the power and adjust the voltage to the rated value of 28V, supply power to the UUT, and conduct performance testing on the UUT to verify that it can provide the performance specified in the normal state. Test Procedure

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

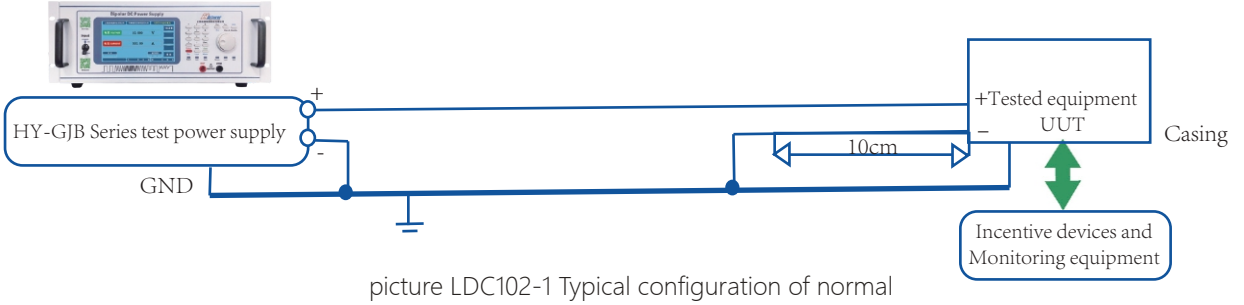
Modulate the power supply voltage according to the test conditions A and B in the table above, and supply power to the UUT. Under each test condition, power down the UUT and then re power it up to detect the UUT energy No, restart. After restarting, perform a performance test on the UUT according to the electrical equipment performance test program to verify whether the UUT can provide the performance specified in the power supply and loading status; The duration shall not be less than 30 minutes to verify that UUT can continue to operate normally at the normal steady-state voltage limit.

Record the voltage, duration, successful restart, and UUT performance results under each test condition.

Repeat the above tests in various operating modes of UUT。

Post test inspection

After completing the above tests, adjust the power supply voltage to the rated value of 28V, supply power to the UUT, and conduct performance testing on the UUT to confirm that it is not damaged and can Provide its specified performance under normal power supply conditions.



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

2.3、LDC103 Voltage Distortion Spectrum

This test is used to verify whether the DC 28V electrical equipment can operate normally when the frequency and amplitude specified in the voltage distortion spectrum of GJB181B-2012 occur in the power supply voltage Maintain its specified performance The qualification criteria are shown in the table below:

Voltage Distortion Spectrum Limit				
Parameter	Requirements (typical values)			Corresponding to GJB181B-2012 Chapter number
	Distorted spectrum (Hz)	Distortion amplitude		
		dBV	V	
Voltage distortion spectrum	10	-20.00	0.100	picture 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, and install a calibration resistor as a substitute for the load of UUT. The current passing through the calibration resistor should be the same as that of UUT. Turn on the power, Adjust the voltage to the rated value of 28V。

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

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supplies according to Figure LDC103-1. Turn on the power supply and adjust the voltage to the rated value of 28V to supply power to UUT; right UUT conducts performance testing to verify that it can provide the specified performance under normal power supply conditions。

Test procedure

Adjust the output sine wave of programmable DC power supply or variable frequency power supply, set it to the recorded value corresponding to each test condition in the calibration program, and supply power to UUT: Test condition B, set a programmable DC power supply or variable frequency power supply to output an average DC voltage of 28V, and superimpose the AC sine component with a rate change of 25Hz, The amplitude of AC voltage is 0158V root mean square value; Set the voltage distortion frequency and amplitude specified in Table LDC103-2 in sequence。

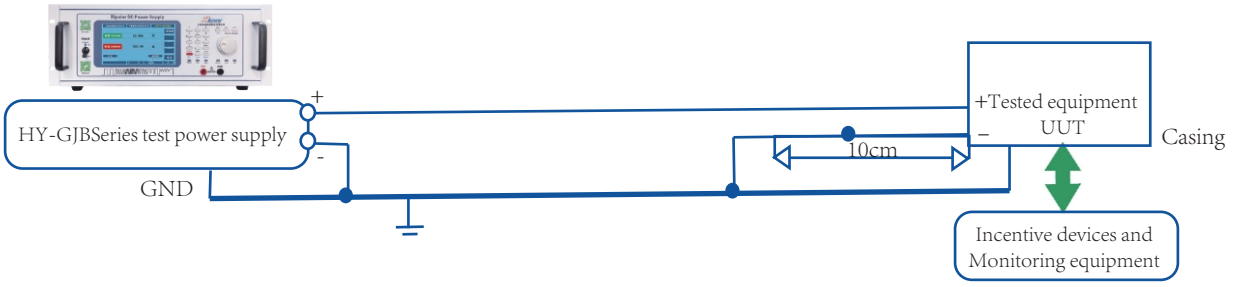
Under each test condition, perform performance tests on the UUT according to the performance test procedure of the electrical equipment to verify whether the UUT can provide the specified performance under normal power supply conditions; The duration shall not be less than 5 minutes to verify that UUT can continue to operate normally under voltage distortion. After completing the test under one experimental condition, slowly increase the superimposed AC score on one side Measure the frequency and adjust the amplitude while observing the frequency and amplitude of voltage distortion, taking care not to exceed the limit of the voltage distortion spectrum until the next test condition is reached。

Perform the same tests in sequence for test conditions A to K in Table LDC103-2.

Record the voltage, voltage distortion frequency, voltage distortion amplitude, distortion duration, and UUT performance results under each test condition, and the test data record table Refer to Figure LDC103-3. Repeat this experiment in various operating modes of UUT.

Post test inspection

After all the above tests are completed, disconnect the power supply. Connect the power supply and adjust the voltage to the rated value of 28V, no longer adding voltage distortion, and supply power to UUT; Perform performance on UUT Test to confirm that the UUT is not damaged and can provide its specified performance under normal power supply conditions.



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

Voltage Distortion Spectrum Test Conditions			
Test conditions	Distortion frequency (Hz)	Distortion amplitude (root mean square value) (V)	Duration (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 impact of distortion spectrum and the operability of the test method, the distortion spectrum in this test method is only set to 10kHz.

2.4、LDC104 Pulsation

This test is used to verify whether the DC 28V electrical equipment can operate normally and maintain the specified performance when the power supply voltage is fluctuating according to GJB181B-2012.

The qualification criteria are shown in the table below:

Voltage Ripple Limit		
Parameter	Ask	Corresponding to GJB181B-2012 Chapter number
Voltage ripple	Maximum 1.5V	Form 4

Test Method

Pre experimental testing

Disconnect the power supply and install the UUT and HY-GJB series test power supplies 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 pulsating components, Power supply to UUT: Conduct performance tests on UUT to verify that it can provide the specified performance under normal power supply conditions.

Test procedure

Turn on the power supply, set the power supply to the recorded value corresponding to test condition A in the calibration program, adjust the voltage to the rated value of 28V, superimpose the set pulsation component, and apply it to UUT Power supply, perform performance testing on UUT according to the performance testing procedure of the electrical equipment, and verify whether UUT can provide the performance specified in the normal power supply state: the duration is quite long Verify that UUT can continue to operate normally under voltage fluctuations for 30 minutes.

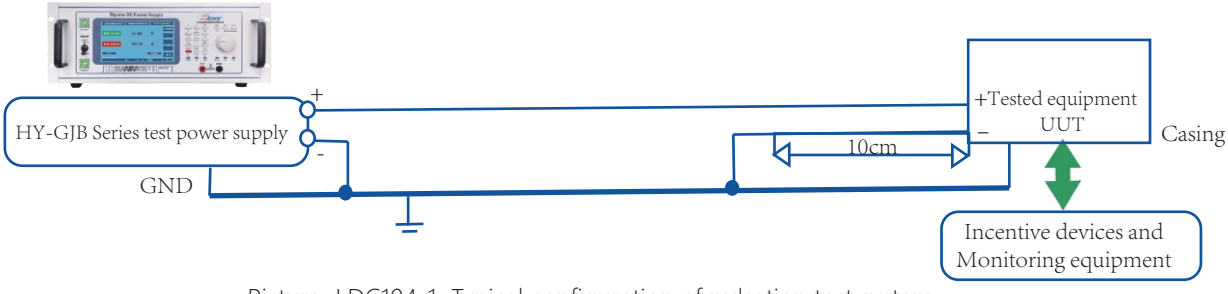
Repeat the above test according to test condition B in Table LDC104-12.

Record data such as voltage, pulsation spectrum, distortion coefficient, duration, and UUT performance results under each test condition.

Repeat this experiment 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 value of 28V to supply power to the UUT: conduct a performance test on the UT to confirm The UUT is not damaged and can provide the specified performance under normal power supply conditions。



Picture LDC104-1 Typical configuration of pulsation test system

Pulsation Test Conditions			
Test conditions	Distortion frequency (Hz)	Distortion amplitude (root mean square value) (V)	Duration (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	

2.5、LDC105 Normal Voltage Transient

This test is used to verify whether the DC 28V electrical equipment can operate normally and maintain the specified performance when the power supply voltage is the normal voltage transient specified in GJB181B-2012。
The qualification criteria are shown in the table below:

Parameter		Power supply conversion interruption limit requirements (typical values)		Corresponding to GJB181B-2012 Chapter number
		Transients Voltage (V)	Transient voltage duration (S)	
Current distortion spectrum	upper limit	50	0.0123	picture 12
		29	0.0825	
	lower limit	18	0.0150	
		22	0.1000	

Test Method

Pre experimental testing

Disconnect the power supply and install the UUT and HY-GJB series test power supplies according to Figure LDC105-1. Turn on the power supply and adjust the voltage to the rated value of 28V to supply power to UUT; For UUT Conduct performance tests to verify that UUT can provide the specified performance under normal power supply conditions。

Normal voltage transient test procedure

Table LDC105-2 lists the voltage transients that UUT must withstand under test conditions A to R. Within 1ms, the voltage should increase or decrease from the steady-state voltage to the value shown in Table LDC105-2 The transient voltage shown is shown in Table LDC105-2, and the duration of the transient voltage is shown in Table LDC105-2. Afterwards, the voltage should return to the steady-state value according to the recovery time listed in the table. For test conditions E and J, 50V overvoltage transient Change the duration to 10ms, with an interval of 05s, and perform 3 times. For test conditions M and P, the duration of the 18V undervoltage transient is 10ms, with an interval of 0.5s, and it is conducted three times. Trial Under conditions Q and R, the duration of the 18V undervoltage transient is 10ms, followed by the 50V overvoltage transient with a duration of 12.5ms, and then the voltage returns to its steady-state value. For each test strip During each voltage transient and after the voltage returns to its normal steady-state range, perform performance testing on the UUT according to the performance testing program of the electrical equipment to verify if the UUT can be improved Provide and maintain the specified performance under normal power supply conditions。

Repeat 5 times for each test condition.

Record the voltage, transient voltage, transient voltage duration, voltage transient (oscilloscope waveform), and UUT performance results under each test condition The data record table is shown in Figure LDC105-2.

Repeat this experiment in various operating modes of UUT.

Repetitive Transient Test Procedure

The power supply provides a continuous and repeatable voltage transient, with the UUT input voltage linearly decreasing from 28.5V to 18V within 2.5ms and then linearly increasing to 45V within 30ms, Then it linearly decreases to 28.5V within 2.5ms. This voltage transient is repeated every 0.5 seconds, as shown in Figure LDC105-3. The performance of UUT is tested according to the performance test procedure of the electrical equipment Testing to verify whether UUT can provide and maintain the specified performance under normal power supply conditions; The duration shall not be less than 30mn to verify that UUT is subjected to repetitive voltage Capable of continuous and normal operation during transients.

Record data such as voltage, voltage transient (oscilloscope waveform), transient voltage duration, and UUT performance results.

Repeat this experiment in various operating modes of UUT.

Post test inspection

After all the above tests are completed, adjust the voltage to the rated value of 28V and supply power to UUT; Conduct performance testing on UUT to confirm that it is not damaged and provide its The performance specified in the normal state of power supply.

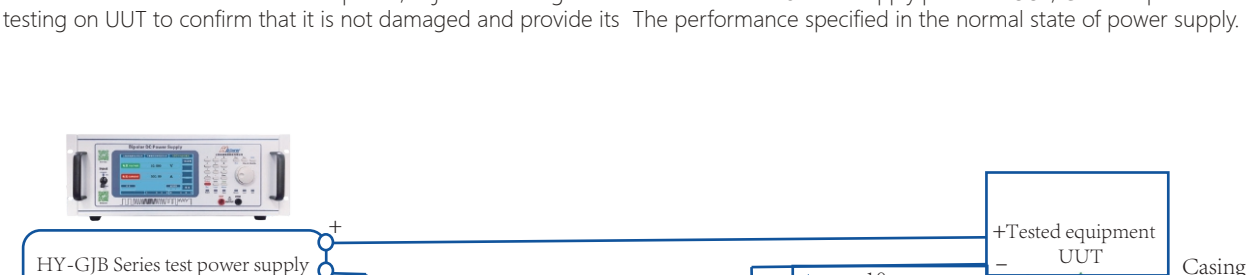
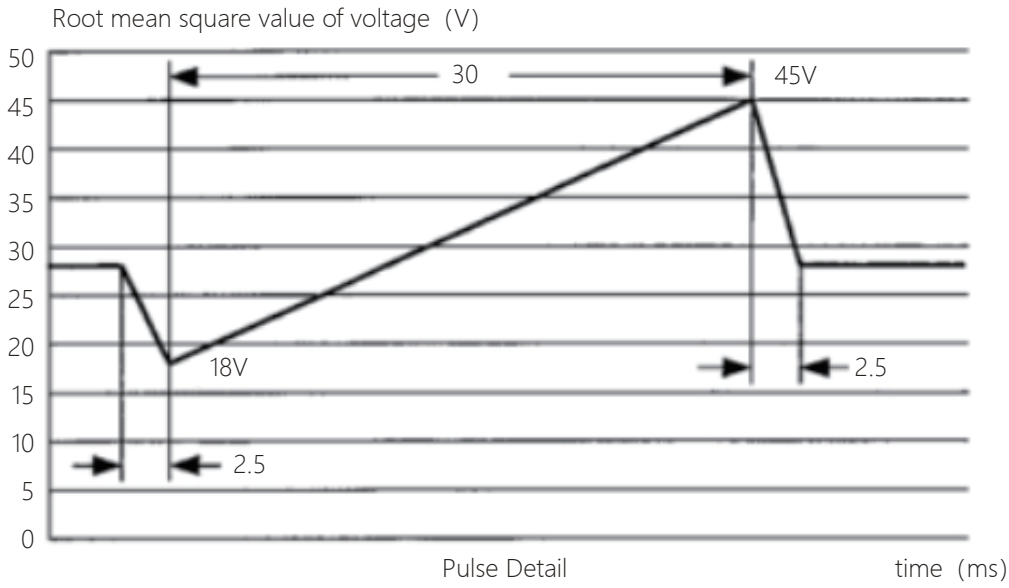
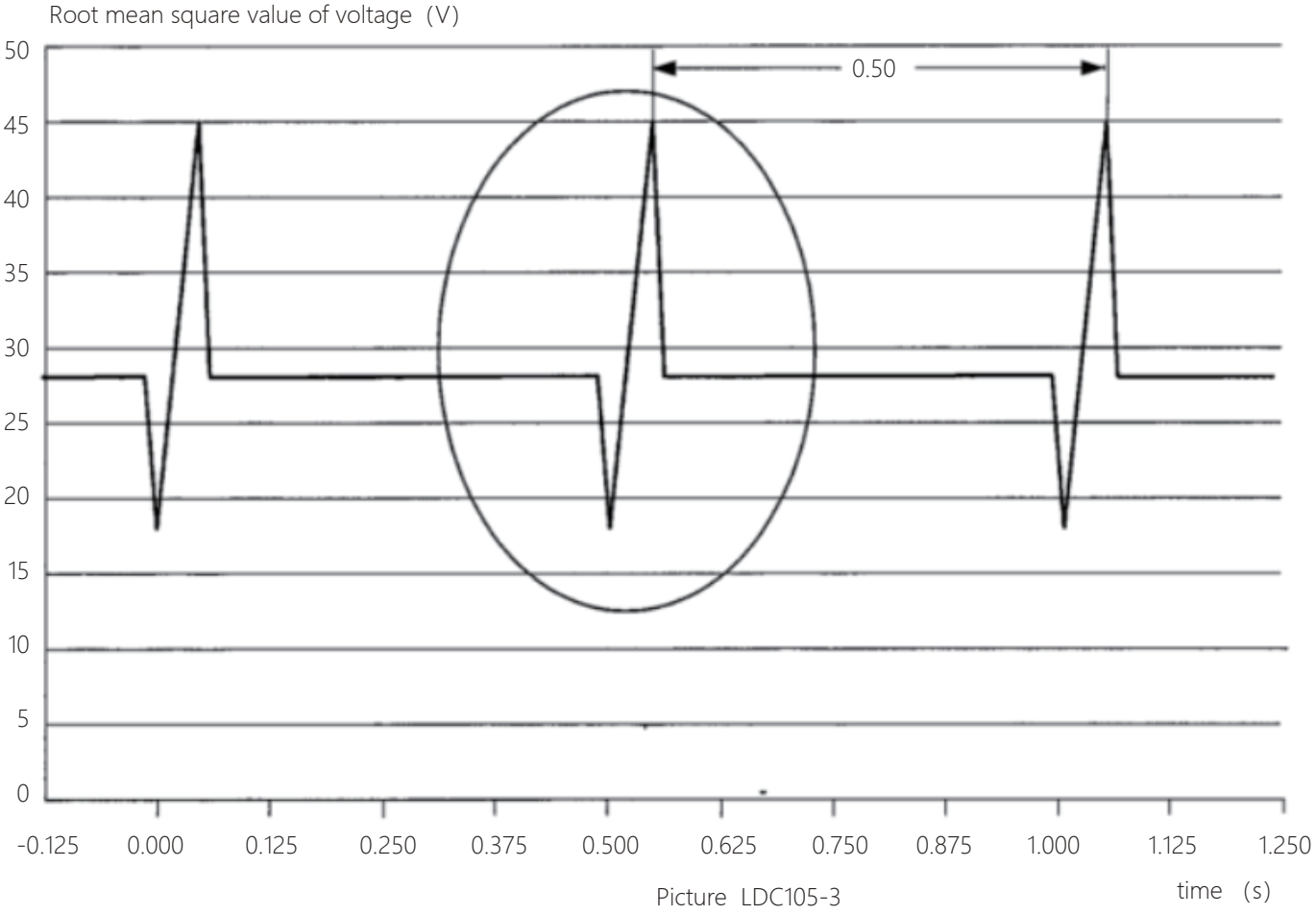


Figure LDC105-1 Typical Configuration of Normal Voltage Transient Test System

Normal Voltage Transient Test Conditions					
Test conditions	Steady-state voltage（V）	From steady-state voltage toTime of transient voltage (ms)	Transient voltage（V）	Transient voltage continuous time（ms）	From transient voltage to steady state Voltage or next transient Time of voltage (ms)
Overvoltage transient					
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 order）	10 (Every interval 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 order）	10 (Every interval 0.5s)	<1
Under voltage transient					
K	29	<1	18	15	<1
L	29	<1	18	15	234
M	29	<1	18（3 order）	10 (Every interval 0.5s)	<1
N	22	<1	18	15	<1
O	22	<1	18	15	85
P	22	<1	18（3 order）	10 (Every interval 0.5s)	<1
Mixed transient					
Q	29之后	<1 <1	18 50	10 12.5	<1 70
R	22之后	<1 <1	18 50	10 12.5	<1 93
Repetitive transient					
S	28.5	<2.5 <3.0	18 45	—a —b	— <2.5
a：The voltage gradually increases　　b：The voltage gradually decreases					





Picture LDC105-3

2.6、LDC201 Power Supply Conversion Interruption

This test is used to verify whether the DC 28V electrical equipment can operate normally and maintain its specified power conversion interruption when the power supply voltage meets the requirements of GJB181B-2012 performance。

The qualification criteria are shown in the table below:

Power Supply Conversion Interruption Limit		
Parameter	Ask	Corresponding to GJB181B-2012 Chapter number
Duration of power interruption	50ms	5.1
Lower limit of normal steady-state voltage (NLSS) voltage	22V	form 4
Upper limit of 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 supplies according to Figure LDC201-1. Turn on the power and adjust the voltage to the rated value of 28V to supply power to UUT: Conduct performance tests to verify that UUT can provide the specified performance under normal power supply conditions。

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 the table The input voltage of UUT should be within The voltage should decrease from steady state value to 0V within 0.25ms, and the duration is shown in Table LDC201-2. Then, the voltage should recover from 0V to steady state value within 0.25ms. For test condition J, three tests should be performed 50ms power interruption test, with an interval of 0.5s each time. For test condition K, after power supply interruption, there is a 50V that lasts for 12.5ms, and then returns to the normal steady-state value within 70ms Overvoltage transient test. For test condition L, a normal undervoltage transient test should be conducted with a duration of 18V for 15ms after power interruption, and then return to the steady-state value after 85ms. For each Test the performance of UUT according to the performance test procedure of electrical equipment under different test conditions to verify whether it can provide the performance specified in the power supply transition state: at the power supply recovery After returning to the normal steady-state range, test the performance of UUT again to verify that it can provide the performance specified in the normal power supply state。

Repeat 5 times for each test condition。

Record the steady-state voltage, duration of power supply interruption, and performance results of UUT under each test condition。

Repeat this experiment in various operating modes of UUT。

Post test inspection

After all the above tests are completed, adjust the power supply voltage to the rated value of 28V and supply power to UUT; Conduct performance testing on UUT to confirm that it is not damaged and provide The performance specified in the normal state of power supply。

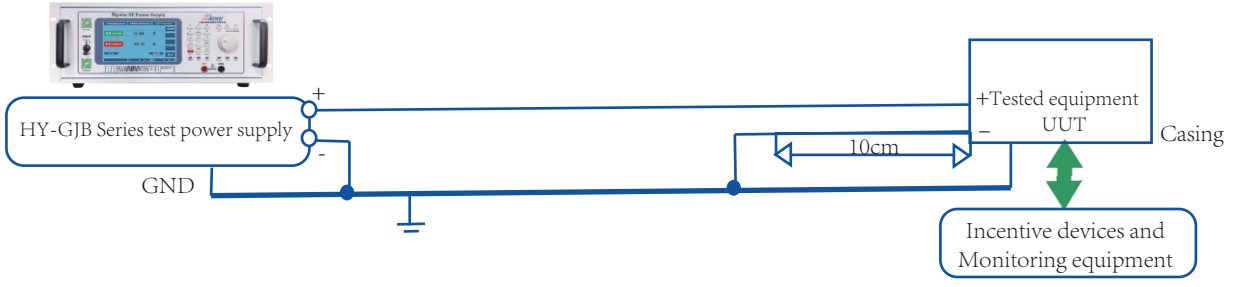


Figure LDC201-1 Typical Configuration of Power Conversion Interruption Test System

Power Supply Conversion Interruption Limit		
Test conditions	Voltage（V）	Duration（ms）
A	28 V	50
B	22 V	50
C	29 V	50
D	28 V	30
E	22 V	30
F	29 V	30
G	28 V	10
H	22 V	10
I	29 V	10
J	28 V	50 （Perform 3 times with an interval of 0.5 seconds between each）
K	28 V	50 （Then, a normal overvoltage transient of 50V occurs, lasting for 12.5ms, and then returns to the steady-state value within 70ms）
L	28 V	50 （Then a normal overvoltage transient of 18V occurred for 15ms, and then returned to the steady-state value within 85ms）

2.7、LDC301 Abnormal Steady-State Voltage

This test is used to verify whether the DC 28V electrical equipment can operate normally and maintain the abnormal steady-state voltage limit specified in GJB181B-2012 when the power supply voltage occurs Prescribed performance。

The qualification criteria are shown in the table below:

Abnormal Steady-State Voltage Limit		
Parameter	Ask	Corresponding to GJB181B-2012Chapter number
Abnormal steady-state voltage lower limit (ALSS) voltage	20.0V	picture 14
Abnormal steady-state 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 supplies as shown in Figure LDC301-1. Turn on the power and adjust the voltage to the rated value of 28V to supply power to UUT: Conduct performance tests to verify that UUT can provide the specified performance under normal power supply conditions。

Test procedure

Adjust the power supply voltage according to test conditions A and B in Table LDC301-2 to supply power to UUT. Under each test condition, power down the UUT and then re power it up Check if UUT can be restarted; After restarting, perform a performance test on the UUT according to the performance test program of the electrical equipment to verify whether it can provide the specifications for abnormal power supply Defined performance, with a duration of no less than 30 minutes. Adjust the power supply voltage to the rated value of 28V, and perform performance testing on UUT according to the performance testing program of the electrical equipment to verify UUT It can automatically restore its performance specified in the normal power supply state without damage.

Record the voltage, duration, success of restart, and performance results of UUT under each test condition.

Repeat this experiment in various operating modes of UUT。

Post test inspection

After all the above tests are completed, adjust the power supply voltage to the rated value of 28V and supply power to UUT; Conduct performance testing on UUT to confirm that it is not damaged and can provide Provide the specified performance under normal power supply conditions。

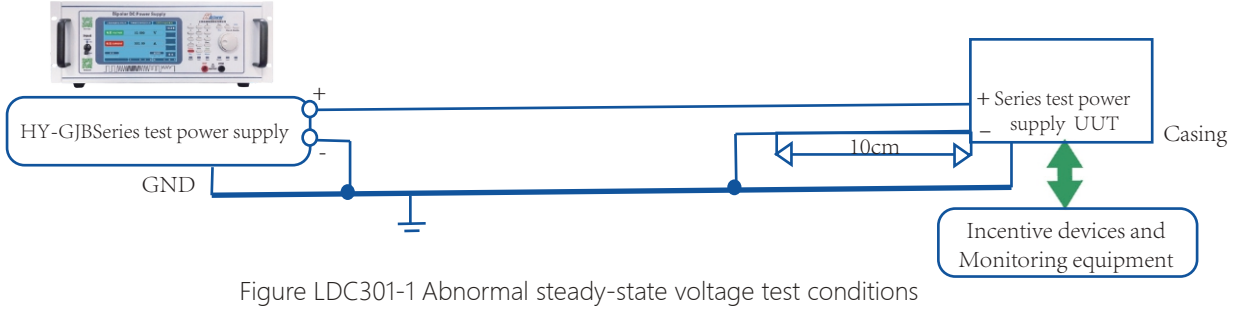


Figure LDC301-1 Abnormal steady-state voltage test conditions

Abnormal Steady-State Voltage Test Conditions	
Test conditions	Voltage (V)
A	20.0V
B	31.5V

2.8、LDC302 Abnormal Voltage Transient

This test is used to verify whether the DC 28V electrical equipment can operate normally and maintain its stability when there is an abnormal stable voltage transient specified in GJB181B-2012 in the power supply voltage Prescribed performance。

The qualification criteria are shown in the table below:

Abnormal Voltage Transient Limit				
parameter		Requirements (typical values)		Corresponding to GJB181B-2012 Chapter number
		Transients Voltage (V)	Transient voltage duration (S)	
Abnormal voltage transient	overvoltage	50	<0.05	picture 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 Figure 14 of GJB 181B-2012 is the extreme case of abnormal voltage transients in the aircraft power supply system, that is, power supply failures, It should not be used as a qualification criterion for this test project.				

Test Method

Pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supplies according to Figure LDC302-1. Turn on the power and adjust the voltage to the rated value of 28V, supply power to UUT: for UUT Conduct performance tests to verify that UUT can provide the specified performance under normal power supply conditions.

Test procedure

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

For test conditions C and F, the duration of the overvoltage transient at 50V is 50ms, with an interval of 0.5s, and it is conducted three times. Duration of undervoltage transient for test conditions 1 and L, 7V Perform 3 times with a duration of 50ms and an interval of 0.5s. 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, Finally, the voltage returns to its steady-state value. For each test condition, during voltage transients, monitor the performance of UUT according to the performance test procedure of the electrical equipment, and verify whether UUT can be used Provide its specified performance in abnormal power supply conditions. Repeat 5 times for each test condition. After the power supply is restored to the normal steady-state range, perform performance testing on the UUT, To verify that UUT can automatically restore its specified performance under normal power supply conditions.

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

Repeat this experiment in various operating modes of UUT.

Post test inspection

After all the above tests are completed, adjust the power supply voltage to the rated value of 28V and supply power to the UUT. Conduct a performance test on the UUT to confirm that it is not damaged and can provide Provide the specified performance under normal power supply conditions。

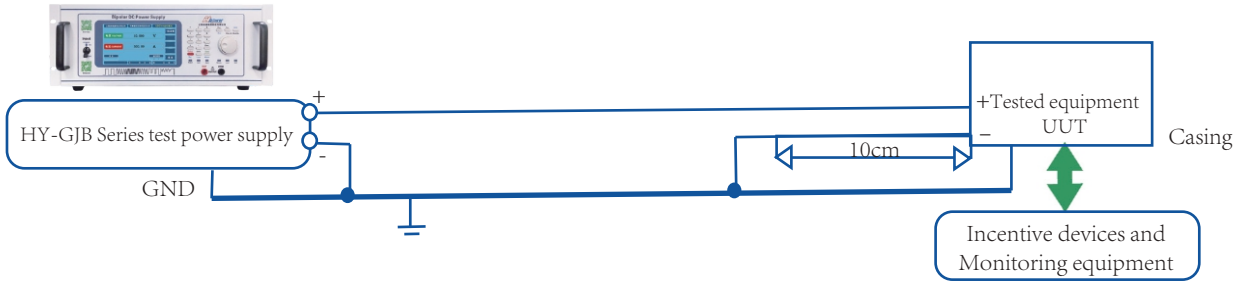


Figure LDC302-1 Typical Configuration of Abnormal Voltage Transient Test System

Abnormal Voltage Transient Test Conditions					
Test conditions	Steady-state voltage（V）	From steady-state voltage to Time of transient voltage (ms)	Transient voltage（V）	Transient voltage continuous time（ms）	From transient voltage to steady state Voltage or next transient Time of voltage（ms）
Overvoltage transient					
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次）	50 (Every interval 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次）	50 (Every interval 0.5s)	<1ms
Under voltage transient					
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	—	—

Normal Voltage Transient Test Conditions					
Test conditions	Steady-state voltage（V）	From steady-state voltage to Time of transient voltage (ms)	Transient voltage（V）	Transient voltage continuous time（ms）	From transient voltage to steady state Voltage or next transient Time of voltage（ms）
Under voltage transient					
I	29	<1	7（3次）	50 (Every interval 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次）	50 (Every interval 0.5s)	<1ms
Mixed transient					
M	29	<1 <1	7 50	10 50	<1ms 80ms
		—	45	—a	40ms
		—	40	—a	149ms
		—	35	—a	4.743s
		—	30	—a	1s
		—	29	—	—
N	22	<1 <1	18 50	10 50	<1ms 18ms
		—	45	—a	40ms
		—	40	—a	149ms
		—	35	—a	4.743s
		—	30	—a	8s
		—	22	—	—
a： The voltage gradually increases　　b： The voltage gradually decreases					

2.9、LDC401 Emergency Steady-State Voltage

This test is used to verify whether the DC 28V electrical equipment can operate normally and maintain its specified emergency steady-state voltage limit when the power supply voltage reaches GJB181B-2012 Performance.

The qualification criteria are shown in the table below:

Emergency Steady-State Voltage And Frequency Limits		
Parameter	Ask	Corresponding to GJB181B-2012 Chapter number
Emergency steady-state voltage lower limit (ELSS) voltage	18V	5.3.2.3
Emergency steady-state voltage upper limit (EHSS) voltage	29V	

Test Method

pretest inspection

Disconnect the power supply and install the UUT and HY-GJB series test power supplies according to Figure LDC401-1. Turn on the power and adjust the voltage to the rated value of 28V to supply power to UUT: Performance testing to verify that UUT can provide the specified performance under normal power supply conditions.

Test procedure

Adjust the power supply voltage according to test conditions A and B in Table LDC401-2 to supply power to UUT. Under each test condition, power down the UUT and then re power it up Check if UUT can be restarted; After restarting, perform a performance test on the UUT according to the electrical equipment performance test procedure to verify whether it can provide the required emergency power supply status Performance: The duration shall not be less than 30 minutes to verify that UUT can continue to operate normally at the emergency steady-state voltage limit.

Adjust the power supply voltage to the rated value of 28V, and perform performance testing on the UUT according to the performance testing program of the electrical equipment to confirm that the UUT can automatically restore its normal power supply state The specified performance without damage.

Record the voltage, duration, successful restart, and UUT performance results under each test condition.。

Repeat this experiment in various operating modes of UUT.。

Post test inspection

After all the above tests are completed, adjust the power supply voltage to the rated value of 28V and supply power to the UUT. Conduct a performance test on the UUT to confirm that it is not damaged and can provide Provide the specified performance under normal power supply conditions。

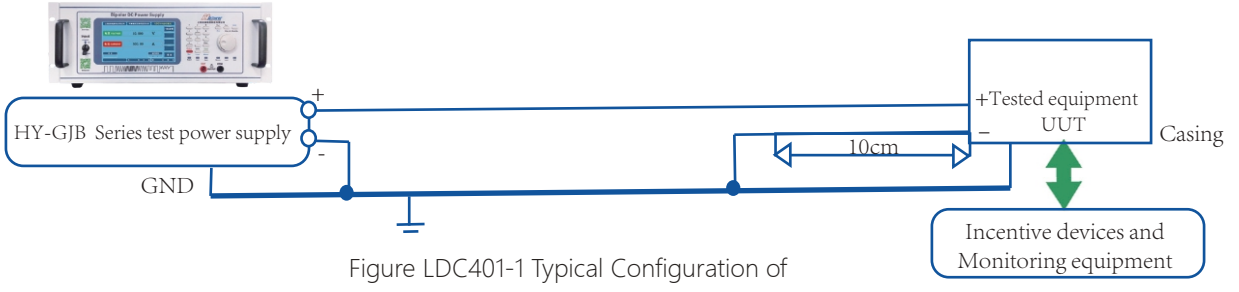


Figure LDC401-1 Typical Configuration of Emergency Steady State Voltage Test System

Emergency Steady-State Voltage Test Conditions		
Test conditions	Voltage (V)	Duration (min)
A	18 V	30
B	29 V	30

3.0、LDC501 Starting Voltage Transient

This test is used to verify whether the DC 28V electrical equipment can operate normally and maintain the specified performance when the power supply voltage is transient at the starting voltage specified in GJB181B-2012.

The qualification criteria are shown in the table below:

Starting Voltage Transient limit		
Parameter	Ask	Corresponding to GJB181B-2012 Chapter number
Starting voltage transient	12V~29V	5.3.2.4

Test Method

Pre experimental testing

Disconnect the power supply and install the UUT and HY-GJB series test power supplies according to Figure LDC501-1. Turn on the power and adjust the voltage to the rated value of 28V to supply power to UUT:Performance testing to verify that UUT can provide the specified performance under normal power supply conditions.

Test procedure

UUT should withstand the transient process of starting voltage specified in Table LDC501-2, with the input voltage decreasing from steady-state value to 12V within 1ms and then increasing at a constant rate to Steady state value. During each transient of starting voltage, perform performance testing on UUT according to the performance testing program of the electrical equipment to verify whether UUT can provide the specifications for its electric starting state Defined performance. Repeat 5 times.

Record data such as 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, perform performance tests on the UUT to verify that it can automatically restore its performance specified in the normal power supply state.

Repeat this experiment in various operating modes of UUT.

Post test inspection.

After the above tests are completed, adjust the power supply voltage to the rated value of 28V, supply power to the UUT, and conduct a performance test on the UUT to confirm that it is not damaged and provide information on its performance Performance specified for normal power supply status。

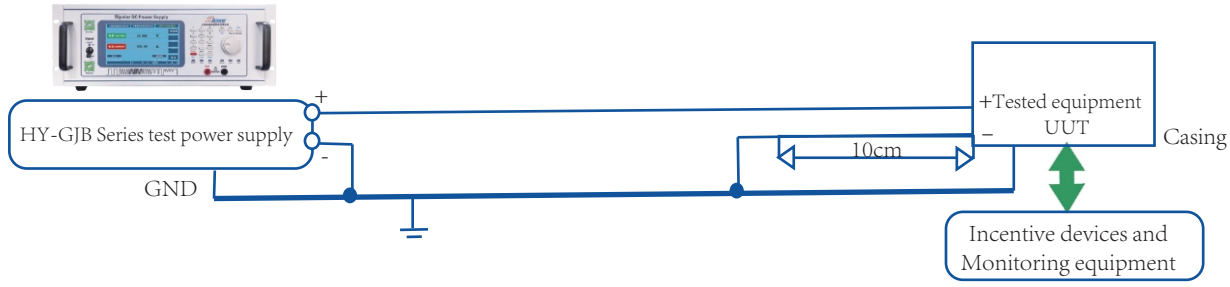


Figure LDC501-1 Typical Configuration of Starting Voltage Transient Test System

Starting voltage transient test conditions				
Test conditions	Steady-state voltage (V)	From steady-state voltage to Time of transient voltage (ms)	Transients Voltage (V)	From transient voltage to steady-state voltage or Time of next transient voltage (ms)
A	29V	<1ms	12V	30s

3.1、LDC601 Outage

This test is used to verify whether the DC 28V electrical equipment can operate normally and maintain the specified performance when the power supply voltage is cut off according to GJB181B-2012.

The qualification criteria are shown in the table below:

Power Outage Limit		
Parameter	Ask	Corresponding to GJB181B-2012 Chapter number
Outage	7s	Picture 14

Test Method

Pre experimental testing

Disconnect the power supply and install the UUT and HY-GJB series test power supplies as shown in Figure LDC601-1. Turn on the power and adjust the voltage to the rated value of 28V to supply power to UUT:Conduct performance tests to verify that UUT can provide the specified performance under normal power supply conditions。

Test procedure

Perform a power outage (0V) test according to the duration listed in Table LDC601-2 for each test condition A to D. The input voltage of UUT should drop from steady-state voltage to 0V within 0.25ms Maintain the duration of 0V as shown in Table LDC601-2, and then restore the voltage from 0V to the steady-state value within 0.25ms. For each test condition, follow the electrical equipment performance test procedure Conduct performance tests on UUT to verify if it can provide the specified performance under power supply failure conditions. After the power supply is restored to the normal steady-state range, according to the performance of the electrical equipment The test program conducts performance testing on UUT to verify that it can automatically restore its specified performance under normal power supply conditions without damage。

Record the voltage, power outage duration, and UUT performance results under each test condition。

Record the voltage, power outage duration, and UUT performance results under each test condition。

Repeat this experiment in various operating modes of UUT。

Post test inspection

After all the above tests are completed, adjust the power supply voltage to the rated value of 28V and supply power to the UUT. Conduct a performance test on the UUT to confirm that it is not damaged and can provide The performance specified in the normal state of power supply。

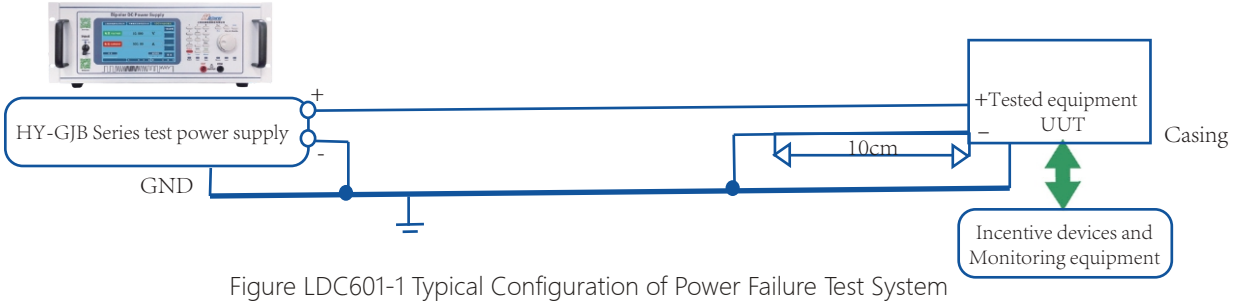


Figure LDC601-1 Typical Configuration of Power Failure Test System

Power outage test conditions	
Test conditions	Voltage (V)
A	100ms
B	500ms
C	3s
D	7s

3.2、LDC602 Reversed Polarity

This test is used to verify that DC 28V electrical equipment will not be damaged when reverse polarity occurs in the supply voltage, or effective physical measures have been taken to prevent reverse polarity from occurring.

The qualification criteria are shown in the table below:

Reverse Polarity Fault		
Parameter	Ask	Corresponding to GJB181B-2012 Chapter number
Reverse polarity fault	DC equipment should not be damaged due to the reverse connection of the positive and negative wires.To prevent input polarity or phase sequence reversal, validated physical methods can be used to achieve this requirement.	5.4.6

Test Method

Pre experimental testing

Disconnect the power supply and install the UUT and HY-GJB series test power supplies according to Figure LDC602-1. Turn on the power and adjust the voltage to the rated value of 28V to supply power to UUT: UUT conducts performance testing to verify that it can provide the specified performance under normal power supply conditions。

Test procedure

Consistency Check

If effective physical measures are taken to prevent reverse polarity from occurring, the effectiveness of the measures should be verified and it should be confirmed that the positive and negative wires cannot be reversed。

If the positive and negative wires may be reversed or the measures taken are ineffective, the following tests shall be conducted。

Test procedure

Disconnect the power supply and install UUT, excitation equipment, and monitoring equipment according to Figure LDC602-2 (reverse polarity connection of positive and negative lines) (when the test power supply can generate negative polarity transmission When leaving, still connect according to Figure LDC602-1, and set the test power supply to negative voltage output. Turn on the power supply and adjust the voltage to the rated value of 28V to supply power to UUT; At power input Under reverse polarity state, maintain power supply for no less than 30 minutes, and verify that UUT will not be damaged or cause unsafe state due to power supply input wire connection。

Record data such as steady-state voltage, duration of reverse polarity, and performance results of UUT。

Repeat the above tests in various operating modes of UUT。

Post test inspection

Disconnect the power supply and install UUT, excitation equipment, and monitoring equipment according to Figure LDC602-1 (correct connection of positive and negative lines). Turn on the power and adjust the voltage to the rated value of 28V, To confirm that the UUT has not been damaged or caused an unsafe state due to the reverse polarity of the power supply, the power supply to the UUT should be maintained for no less than 30mn: according to the performance test procedure of the electrical equipment, the UUT should be tested Conduct performance testing to confirm that the UUT has restored its specified performance under normal power supply without damage。

Record steady-state voltage, duration of test conditions, and UUT performance results. Refer to Figure LDC602-3 for the test data record table。

Repeat the above tests in various operating modes of UUT。

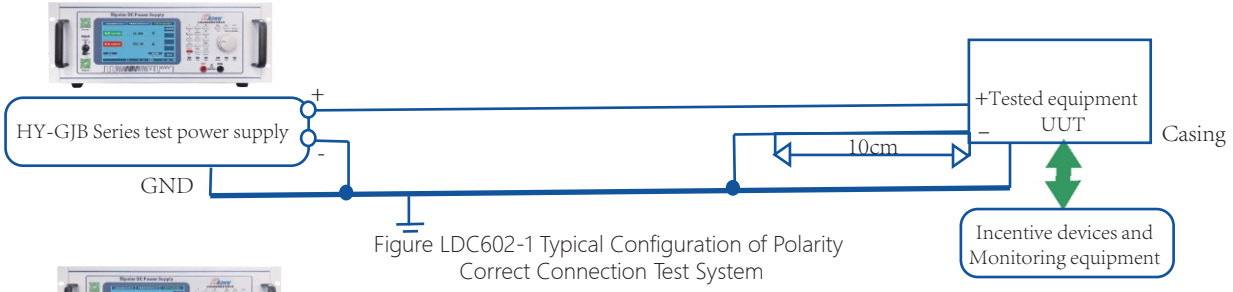


Figure LDC602-1 Typical Configuration of Polarity Correct Connection Test System

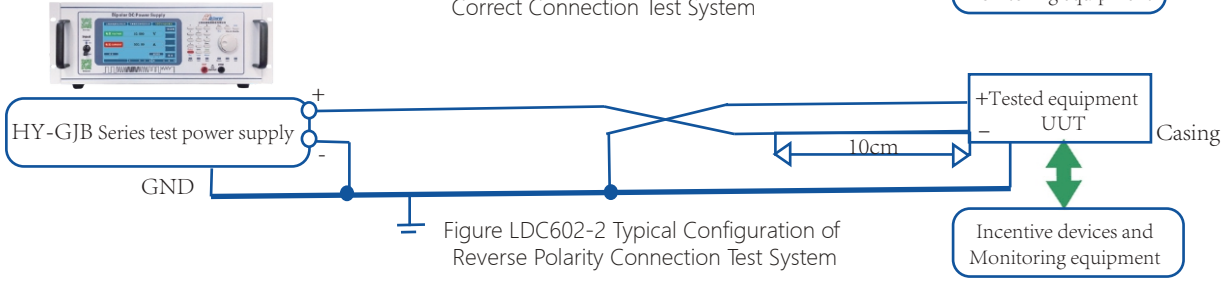
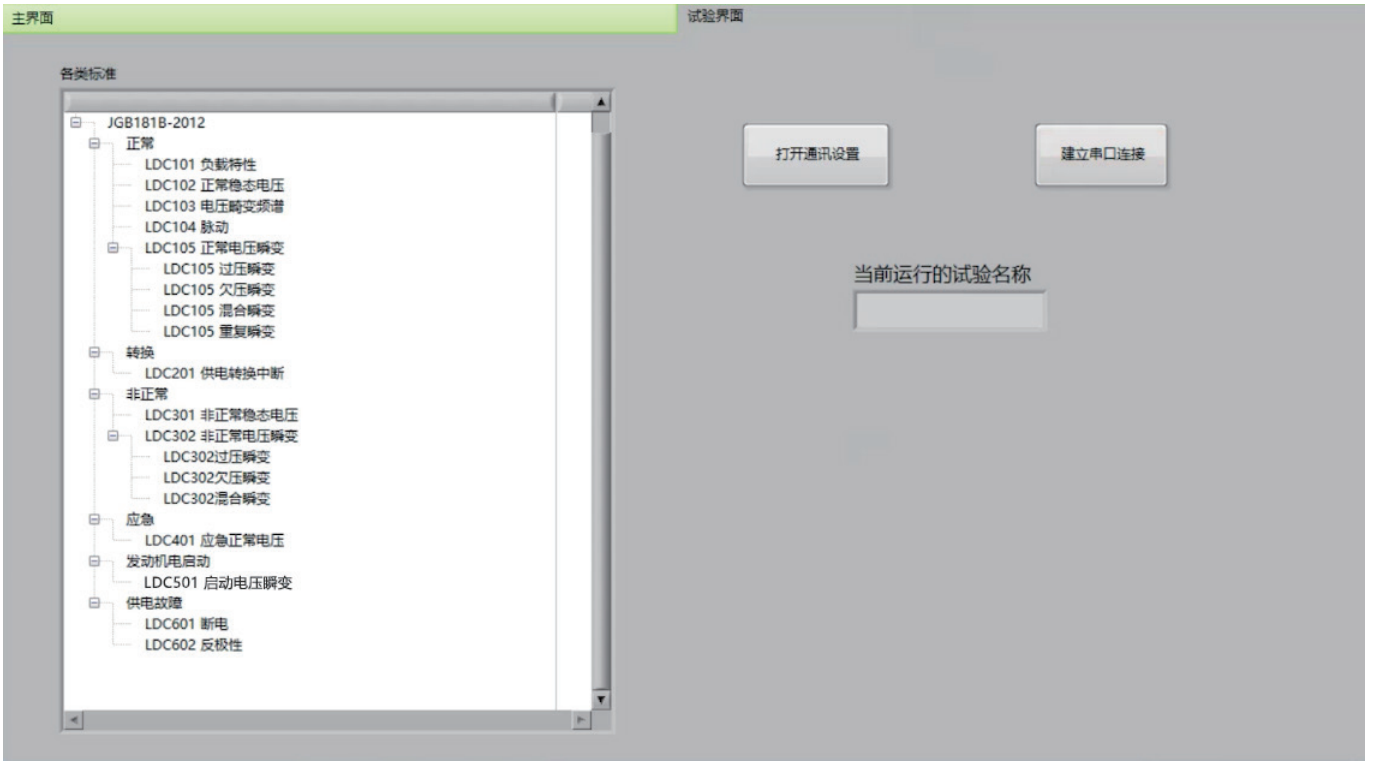


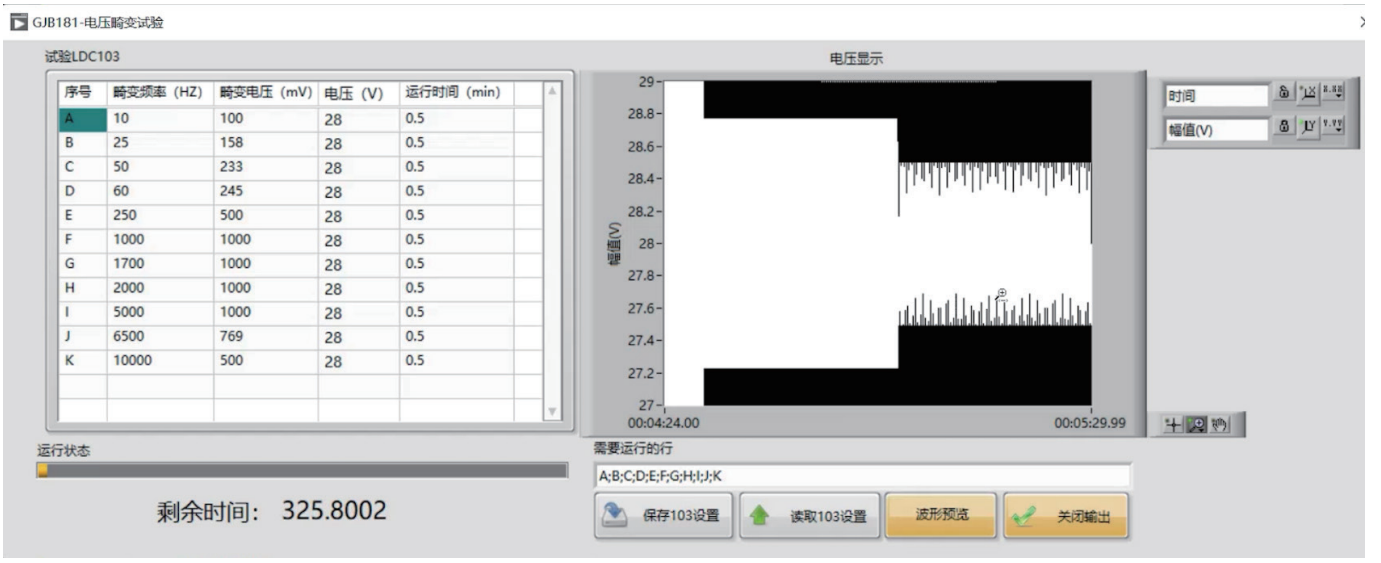
Figure LDC602-2 Typical Configuration of Reverse Polarity Connection Test System

Upper Computer Description

Equipped with upper computer software and equipped with GJB181B-2012 aircraft power supply characteristic standard DC 28V testing all items, with clear entries. Directly click on the test project, You can open the special page. The default values within each test project are standard values. Customers can also directly click on the panel to modify the values according to their own needs。

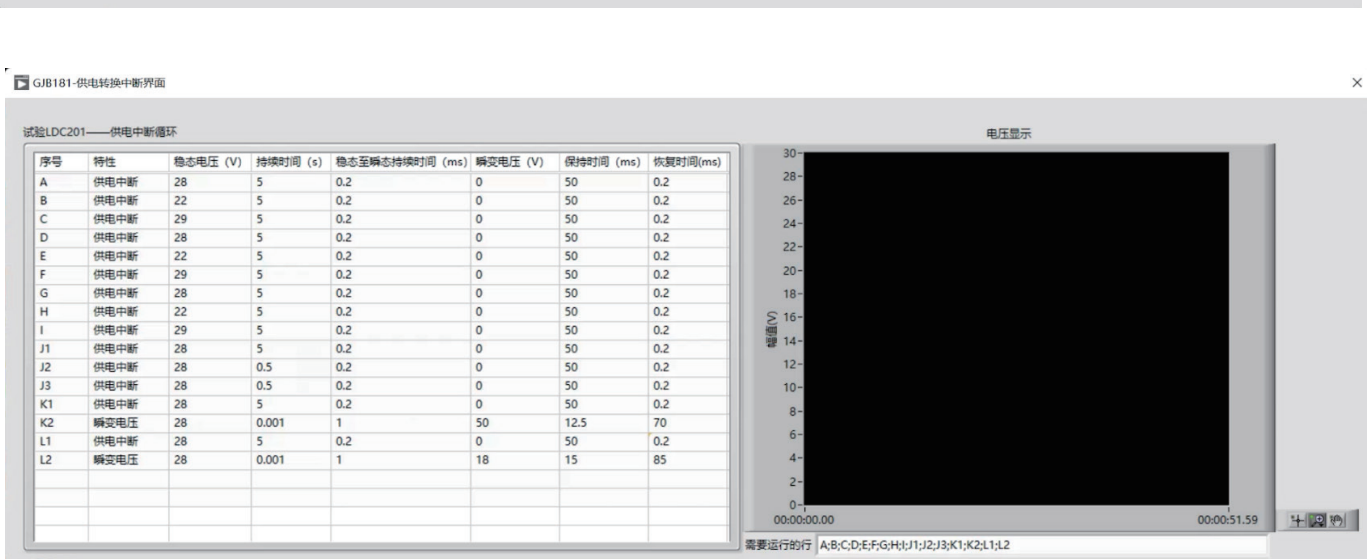


Upper computer software homepage



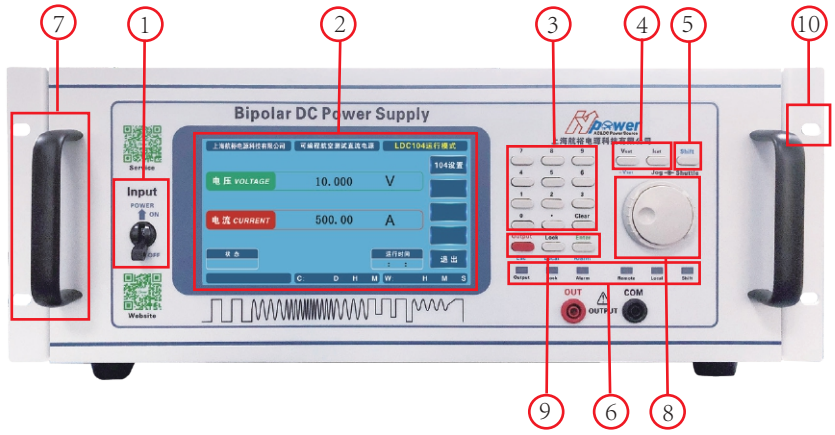
LDC103


GJB181-正常电压瞬变试验
试验LDC105——过压瞬变
电压显示
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
幅值（V）
00:00:47.15
00:00:52.54
需要运行的行 A;B;C;D;E1;E2;E3;F;G;H;I;J1;J2;J3
运行状态
过压瞬变剩余循环次数： 5 次
过压瞬变循环次数
试验结束后电压
当前运行的行
读取瞬变设置
保存瞬变设置
时间
幅值（V）
波形预览
关闭瞬变


GJB181-供电转换中断界面
试验LDC201——供电中断循环
电压显示
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
幅值(V)
00:00:00.00
00:00:51.59
需要运行的行 A;B;C;D;E;F;G;H;I;J1;J2;J3;K1;K2;L1;L2
运行状态
供电中断剩余循环次数： 0 次
供电中断循环次数
试验结束后电压
当前运行的行
读取201设置
保存201设置
时间
幅值(V)
波形预览
启动LDC201

7-Inch Large LCD Display Screen

9.1 Control panel description

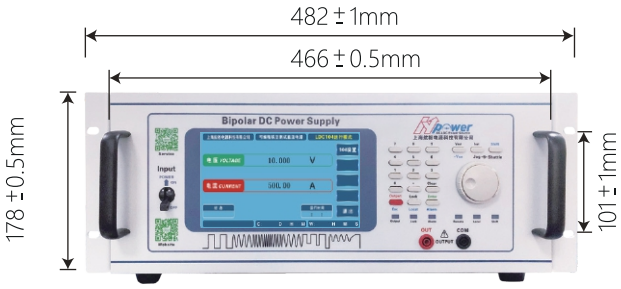


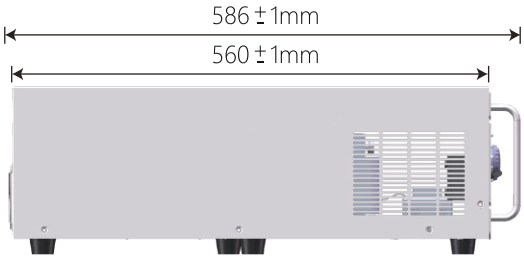
1、 Power input circuit breaker;
2、 7-inch LCD display window display: Voltage and current setting values, voltage and current measurement values、Function Settings Menu;
3、 Function buttons: used for required numerical input and parameter settings;
4、 Voltage/current setting key
5、 Shift Function reuse key
6、 Status
7、 Chassis handle
8、 Multistage shuttle adjustment knob, with the inner circle adjusted one word at a time, and the outer circle divided into ± 8 adjustable segments;
9、 Lock lock, Enter confirmation, Esc exit Local, Reset restart/Alarm alarm, Output ON/OFF switch
10、19 inch standard rack mounting holes

9.2 Display screen

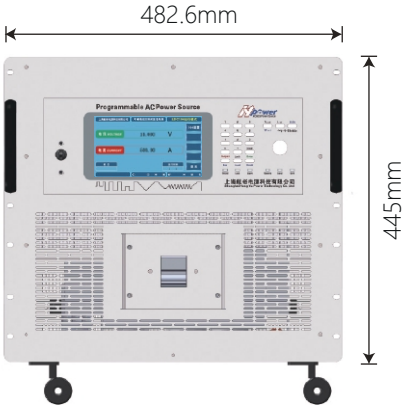
Dimension

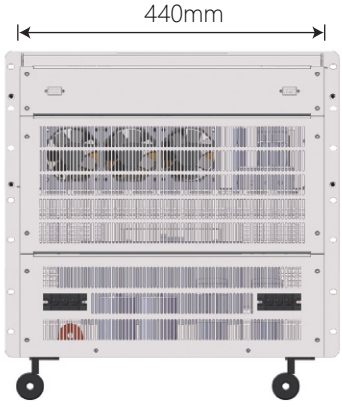
4U 430(W)*560(D)*178(H)mm

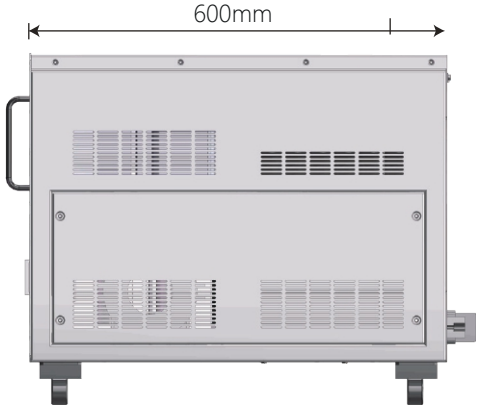




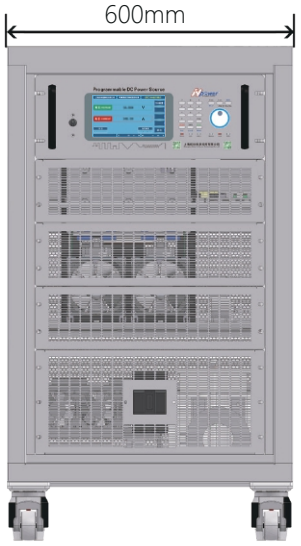
10U 440(W)*600(D)*445(H)mm

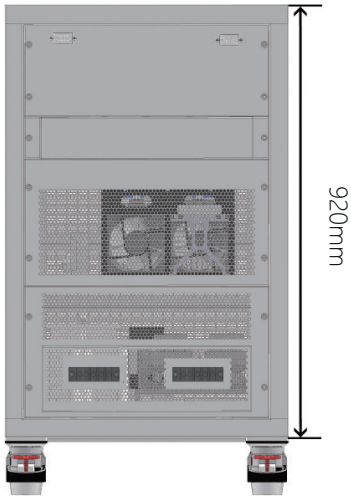


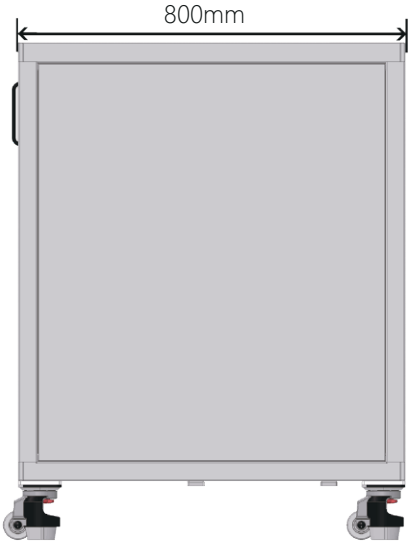




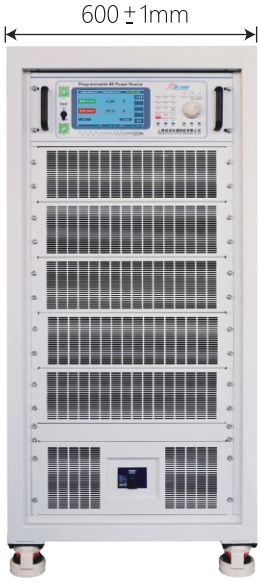
18U 600(W)*800(D)*920(H)mm

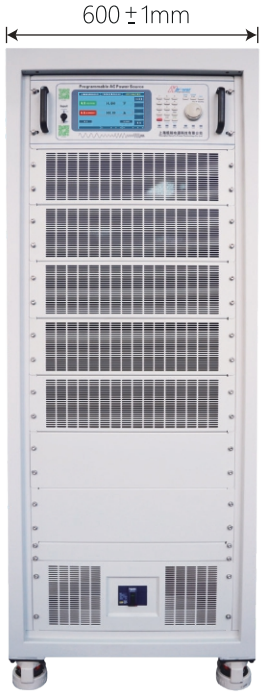


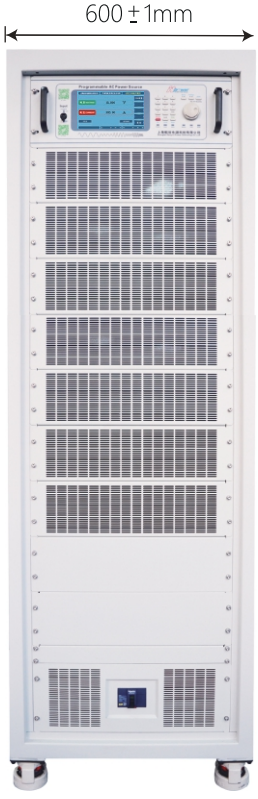




24U 600(W)*800(D)*1190(H)mm
30U 600(W)*800(D)*1453(H)mm
36U 600(W)*800(D)*1718(H)mm







Aerospace And National Defense Military Industry Research Institute

china aerospace | CASIC | aviation industry | China Aerospace | CETC | CSSC | CSIC

CASC 800 institute (Shanghai Aerospace Precision Machinery Research Institute)
CASC 801 institute (Shanghai Institute of Space Propulsion)
CASC 803 institute (Shanghai Institute of Space Propulsion)
CASC 804 institute (Shanghai Aerospace Electronic Communication Equipment Research Institute)
CASC 805 institute (Shanghai Aerospace Systems Engineering Research Institute)
CASC 808 institute (Shanghai Institute of Precision Metrology and Testing)
CASC 811 institute (Shanghai Space Power Research Institute)
CASC 812 institute (Shanghai Satellite Equipment Research Institute)
CASC 502 institute (Beijing Institute of Control Engineering)
CASC 510 institute (Lanzhou Institute of Space Technology Physics)
CASIC 206 institute (Beijing Institute of Mechanical Equipment)
CASIC 307 factory (Aerosun Corporation)
CASIC 33 institute (Institute 33 of Aerospace Science and Industry Third Institute)
CASIC 3651 factory (Guizhou Aerospace Linquan Motor Co., Ltd)

AVIC 603 institute (AVIC Xi'an Aircraft Design and Research Institute)
AVIC 613 institute (China Aviation Industry Group Luoyang Electro Optic Equipment Research Institute)
AVIC 615 institute (China Aviation Industry Group Luoyang Electro Optic Equipment Research Institute)
AVIC 618 institute (Xi'an Automatic Flight Research Institute of China Radio Aviation Research Institute)
AVIC 631 institute (AVIC Aerospace Computing Technology Research Institute)
AVIC 105 factory (Tianjin Aviation Electromechanical Co., Ltd)
AVIC 115 factory (Shaanxi Aviation Electric Co., Ltd)
AVIC 118 factory (Shanghai Aviation Electrical Appliances Co., Ltd)
AVIC 181 factory (Wuhan Aviation Instrument Co., Ltd)
AVIC 607 institute (China Leihua Electronic Technology Research Institute)
AVIC 304 institute (Beijing Great Wall Metrology and Testing Technology Research Institute)
AECC 606 institute (Shenyang Engine Research Institute)

CETC 14 institute (Nanjing Institute of Electronic Technology)
CETC 21 institute (Shanghai Micromotor Research Institute)
CETC 23 institute (Shanghai Transmission Line Research Institute)
CETC 36 institute (Jiangnan Electronic Communication Research Institute)
CETC 38 institute (East China Electronic Engineering Research Institute)
CETC 50 institute (Shanghai Microwave Technology Research Institute)
CETC 51 institute (Shanghai Microwave Equipment Research Institute)
CETC 54 institute (Shijiazhuang Communication Measurement and Control Technology Research Institute)
CETC 55 institute (Nanjing Institute of Electronic Devices)
CSIC 707 institute (Tianjin Institute of Navigation Instruments)
CSIC 7107 institute (Shaanxi Aerospace Navigation Equipment Co., Ltd)
CSIC 719 institute (Wuhan Second Ship Design and Research Institute)
CSIC 704 institute (Shanghai Shipbuilding Equipment Research Institute)
CSIC 726 institute (Shanghai Institute of Ship Electronic Equipment)
Jiangnan Shipbuilding (Group) Co., Ltd
Nanjing Panda Electronics Co., Ltd
State owned 741 Factory (Nanjing East China Electronics Group Co., Ltd.)

Scientific Research & Third Party Quality Inspection Institutions

Institute of Physical and Chemical Technology (Beijing)
Urban Environment Research Institute (Xiamen)
Institute of Electrical Engineering (Beijing)
Institute of Applied Physics (Shanghai)

The Chinese People's Liberation Army

South China Sea Fleet

East China Sea Fleet

North Sea Fleet

Navy Factory 701/702

4724 Factory (Shanghai Haiying Machinery Factory)

95861 Unit (Air First Base)

The 5720th Factory of the People's Liberation Army of China

Commercial Aviation

COMAC

Commercial Aircraft Corporation of China Limited

Collins Aerospace

Rockwell Collins

GAMECO

Guangzhou Aircraft Maintenance Engineering Co., Ltd

Ameco

Beijing Aircraft Maintenance Engineering Co., Ltd

Military Academies And Local Universities

national university of defense technology

Aerospace Engineering University

Army Engineering University

air force engineering university

naval university of engineering

Dalian Naval Academy

Naval Aviation University

Beihang University

Beijing Institute of Technology

Harbin Institute of Technology

Harbin Engineering University

Nanjing University of Aeronautics and Astronautics

Nanjing University of Science and Technology

Northwestern Polytechnical University

University of Science and Technology of China

Tsinghua University

Peking University

Shanghai Jiaotong University

Zhejiang University

Tianjin University

Huazhong University of Science and Technology

University of Electronic Science and technology

Shanghai University

Beijing University of Technology

Shanghai Maritime University

Dalian University of Technology

Dalian Maritime University

South China University of Technology

Huazhong University of Science and Technology

Xi'an Electronic Technology

Xi'an Jiaotong University

Sichuan University

donghua university

north china institute of aerospace engineering

Fudan University

Xiamen University

north china electric power university

Changchun Institute of Technology

xiangtan university

zhejiang university of technology

Xi'an University of technology

University of Electronic Science and Technology of China

Cooperative Clients (Partial)

Power Semiconductor Customers

Changchun Guoke

Electrical industry

China Resources Microelectronics

Shanghai Huinengtai Semiconductor

Yuexin Technology

Wishing to create technology

Group core microelectronics

Hangzhou Zhongsi

Feishide

Suzhou Lianxun Instrument

Weiyujia Semiconductor

Shanghai Zhanxin Semiconductor

Chengxin Technology

Zhuoxinda Technology

Enterprises In The Field Of Automotive Electronics

China Automotive Research and Development

Heavy Industry Automotive Research and Development

BMW Brilliance

Red Banner

SAIC Group

SAIC Volkswagen

GEELY

tesla

Weilai

Xiaomi Automobile

BYD

value

polary

Lantu Automobile

Inovance

HAOMO.AI

MKLtech

Shanghai Tongmin Vehicle

Ningde Era

Human Horizons

Hezhong New Energy

High Tech R&D Enterprises

Huawei

FARATRONIC

Panasonic

EPCOS

TYCO

Weidmuller

Honeywell

Nader

SIEMENS

ABB

Schneider

NOSRK

HONGFA

EOPLE

FLUKE

Philips

Gree

Guilin Rubber Machinery Factory

CASCO

CRRC

US PI

HILTI

BOSCH

linde

NARI-TECHNOLOGY

Shanghai Electric

New Thunder Energy

Silan

Official WeChat:
HY Power-cn

About Us

Hangyu Power was founded in 2011 and is a national high-tech enterprise, Located in Songjiang, the birthplace of the G60 Science and Technology Innovation Corridor in the Yangtze River Delta, for over a decade Strive to provide customers with accurate, intelligent, and convenient testing power solutionsPlan.

Our company adheres to the product positioning of "specialty, precision, specialty, and novelty", and On the basis of targeting the market demand for "import substitution", propose "poor The development strategy of "differentiated import substitution" and "high-quality manufacturing"is committed to Innovative development of testing power supply technology in China, promoting the rejuvenation of science and technology in China The national cause is thriving.

Hangyu Power Series products cover power semiconductors, automotive electronics Aerospace, Defense and Military Industry, Low Voltage Electrical Appliances, Medical, Sensors Capacitors, inductors, smart grids, airborne, shipborne, weapons, ships.

Radar, communication, rail transit, power electronics, and other testing and other disciplines In the field of research, we strive to achieve perfect import substitution, with excellent military q uality and service,

Win unanimous praise from users.

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website:www.hangyupower.com

2009 Establishing Shanghai Ouzu Electronics Brand

2010 Successfully delivered 400kVA high-power AC power supply

2011 Hangyu Power Supply was established and officially put into operation as a three-phase precision AC power supply and militaryUsing a gyroscope to test the power supply, replacing Russian made products

2012 Formal production of programmable variable frequency power supply and AC constant current source

2013 Formal production of programmable AC/DC power supply and HY-AE excitation power supply

2014 Formal production of high-power bipolar testing power supply

2015 Formal production of HY-PM series and HY-GT series new models Dual phase/three-phase gyroscope power supply

2016 HY-HP series programmable high-power DC power supply officially put into operation

2017 HY-HV series programmable high-voltage DC power supply officially put into operation

2018 HY-CTL/CTS capacitor testing high-frequency high current testing power supply And successfully delivered 100kHz, 100Arms

2019 Official production of high-speed power supply for automotive electronic testing within 500kHz

2020 Officially put into operation LV123 new energy vehicle testing high-voltage ripple testing power supply

2021 HY-UHS series ultra-high stability magnet power supply officially put into operation

2022 HY-HVL series linear high-voltage programmable DC power supply officially put into operation