Z⁺ 800 H.V Series

IEC 61000

DATA

<table>
<thead>
<tr>
<th>APPD</th>
<th>CHK</th>
<th>DWG</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kami S.</td>
<td>Kami S.</td>
<td>Michael G.</td>
</tr>
</tbody>
</table>
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* Test results are typical data. Nevertheless, the following results are considered to be actual capability data because all units have nearly the same characteristics.
1. Electrostatic Discharge Immunity Test (IEC61000-4-2)

(1) Equipment used

Electrostatic discharge simulator: ESS-2000 (NOISEKEN)
Discharge resistance: 330Ω Capacitor: 150pF

(2) Test conditions

Input voltage: 115, 230Vac Output voltage: 100%
Output current: 100% Polarity: +, –
Number of tests: 10 times Ta: 25°C
Discharge interval: >1 Second

(3) Test method and Device test point

Contact discharge: FG, Case screw
Air discharge: Input and Output terminal

(4) Acceptable conditions

1. Output voltage regulation doesn't exceed ±5% of initial (before test) value during test.
2. Output voltage to be within regulation specification after the test.
3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(5) Test Result

<table>
<thead>
<tr>
<th>Contact Discharge (KV)</th>
<th>Z320-2.5</th>
<th>Air Discharge (KV)</th>
<th>Z320-2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>PASS</td>
<td>8</td>
<td>PASS</td>
</tr>
</tbody>
</table>
2. Radiated Radio-Frequency Electromagnetic Field Immunity Test 
(IEC61000-4-3)

(1) Equipment used

Test Laboratory: Hermon Laboratories Ltd.

(2) Test conditions

Input voltage: 115, 230Vac
Output current: 100%
Electromagnetic Frequency: 80~1000MHz
Distance: 2.4m
Sweep condition: 1.0% Step Up, 2.8 seconds Hold
Test Angle: Top/Bottom, Both Sides, Front/Back

Output voltage: 100%
Amplitude Modulated: 80%, 1kHz
Ambient temperature: 25°C
Wave Angle: Horizontal and Vertical

(3) Test Method:

![Test Method Diagram]

(4) Acceptable conditions

1. Output voltage regulation doesn't exceed ±5% of initial (before test) value during test.
2. Output voltage to be within regulation specification after the test.
3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(5) Test Result

<table>
<thead>
<tr>
<th>Radiated Field Strength (V/m)</th>
<th>Z320-2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>PASS</td>
</tr>
</tbody>
</table>
3. Electrical Fast Transient / Burst Immunity Test (IEC61000-4-4)

(1) Equipment used

EFT/B Generator: TESEQ NSG-3060
CDN-3063

(2) Test conditions

Input voltage: 115, 230Vac  Output voltage: 100%
Output current: 100%  Test time: 1 minute
Polarity: -,+  Ambient temperature: 25°C
Number of tests: 3 times

(3) Test method and Device test point

Neutral (N), Line (L), Ground (FG) apply pulses from EFT/B Generator
to N, L, FG separately, as well as, all at the same time.

(4) Acceptable conditions

1. Output voltage regulation doesn't exceed ± 5% of initial (before test) value during test.
2. Output voltage to be within regulation specification after the test.
3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(5) Test Result

<table>
<thead>
<tr>
<th>Test Voltage (kV)</th>
<th>Repetition Rate (kHz)</th>
<th>Z320-2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5</td>
<td>PASS</td>
</tr>
</tbody>
</table>

TDK-Lambda
4. Surge Immunity Test (IEC61000-4-5)

(1) Equipment used

- Surge Generator: TESSEQ NSG-3060
  CDN-3083
- Coupling impedance: Common - 12Ω, Normal - 2Ω
- Coupling capacitance: Common - 9 uF, Normal - 18 uF
- Coupling network: CDN110 (SCHAFFNER)

(2) Test method and device test point

- Input voltage: 115, 230Vac
- Output voltage: 100%
- Output current: 100%
- Number of tests: 5 times
- Polarity: -, +
- Ambient temperature: 25°C
- Phase: 0°, 90°

(3) Acceptable conditions

1. Output voltage regulation doesn't exceed ± 5% of initial (before test) value during test.
2. Output voltage to be within regulation specification after the test.
3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(4) Test Result

<table>
<thead>
<tr>
<th>Test Voltage (kV)</th>
<th>Z320-2.5 Common</th>
<th>Test Voltage (kV)</th>
<th>Z320-2.5 Normal</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>PASS</td>
<td>1.0</td>
<td>PASS</td>
</tr>
<tr>
<td>2.0</td>
<td>PASS</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5. Conducted Disturbances Induced by Radio-Frequency Field Immunity Test (IEC61000-4-6)

(1) Equipment used

RF Signal Generator 10kHz-1050MHz: Fluke,6061A
RF Amplifier 10kHz-220MHz,150W: Amplifier Research,150L
Coupling/Decoupling Network: HL CDN 801-M3

(2) Test Condition:

Output voltage: 100%
Input voltage: 115, 230Vac
Output current: 100%

Electromagnetic Frequency: 150kHz~80MHz
Type of modulation: AM 80% @ 1khz
Test Voltage: 3Vms prior to modulation
Dwell Time: 3s
Frequency Step: 1.0% of current frequency

Ambient temperature: 25°C

(3) Test Method:

(4) Acceptable conditions

1. Output voltage regulation doesn't exceed ± 5% of initial (before test) value during test.
2. Output voltage to be within regulation specification after the test.
3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(5) Test Result

<table>
<thead>
<tr>
<th>Test Voltage Level (V)</th>
<th>Z320-2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>PASS</td>
</tr>
</tbody>
</table>
6. Power Frequency Magnetic Field Immunity Test (IEC61000-4-8)

(1) Equipment used

Test Laboratory: Hermon Laboratories Ltd.

(2) Test Condition:

<table>
<thead>
<tr>
<th></th>
<th>Output Voltage: 100%</th>
<th>Frequency: 50Hz</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Voltage:</td>
<td>115, 230Vac</td>
<td></td>
</tr>
<tr>
<td>Output Current:</td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Magnetic Field Strength:</td>
<td>30A/m</td>
<td></td>
</tr>
<tr>
<td>Duration Time:</td>
<td>10 min.</td>
<td>Ambient Temperature: 25°C</td>
</tr>
</tbody>
</table>

(3) Test Method:

![Test Diagram]

(4) Acceptable conditions

1. Output voltage regulation doesn't exceed ± 5% of initial (before test) value during test.

2. Output voltage to be within regulation specification after the test.

3. Along with 1 and 2, no discharge of fire or smoke, as well as no output failure.

(5) Test Result

<table>
<thead>
<tr>
<th>EUT Positions</th>
<th>Z320-2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>PASS</td>
</tr>
<tr>
<td>Y</td>
<td>PASS</td>
</tr>
<tr>
<td>Z</td>
<td>PASS</td>
</tr>
</tbody>
</table>
7. Voltage Dips, Short Interruptions Immunity Test (IEC61000-4-11)

(1) Equipment used

AC Source: 6590 (CHROMA)
Oscilloscope: DL1740EL (Yokogawa)

(2) Test Condition:

<table>
<thead>
<tr>
<th>Input voltage: 115, 230Vac</th>
<th>Output voltage: 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Output current: 100%</td>
<td>Frequency: 50Hz</td>
</tr>
<tr>
<td>Repetition: 0.1Hz</td>
<td>Ambient temperature: 25°C</td>
</tr>
<tr>
<td>Number of tests: 3 times</td>
<td></td>
</tr>
</tbody>
</table>

(3) Test Method:

(4) Acceptable conditions

1. Output voltage to be within output voltage regulation specification after the test.
2. No discharge of fire or smoke, as well as no output failure.

(5) Test Result

<table>
<thead>
<tr>
<th>Test level</th>
<th>Dip rate</th>
<th>Continue time ts</th>
<th>Z320-2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>70%</td>
<td>30%</td>
<td>500ms</td>
<td>PASS</td>
</tr>
<tr>
<td>40%</td>
<td>60%</td>
<td>200ms</td>
<td>PASS</td>
</tr>
<tr>
<td>0%</td>
<td>100%</td>
<td>5000ms</td>
<td>PASS</td>
</tr>
</tbody>
</table>
8. Input Current Harmonics Test (IEC61000-3-2)

(1) Equipment used

AC Power Analyzer: WT110 (Yokogawa)
AC Source: 6590 (CHROMA)

(2) Test conditions:

Input voltage: 115, 230Vac
Output current: 100%

Output Voltage: 100%

(3) Test Method:

Vin: 115Vac

Vin: 230Vac

IEC61000-3-2 Limit (Class A)