

# ZUP-400 SERIES TEST DATA IEC1000

| DWG: IA549-58-01 |             |             |            |
|------------------|-------------|-------------|------------|
| QA APPD          | APPD        | CHK         | DWG        |
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| OCT/10/99        | Oct-10-99   | OCT/10/99   | 10.10.1999 |

 **NEMIC-LAMBDA LTD.**

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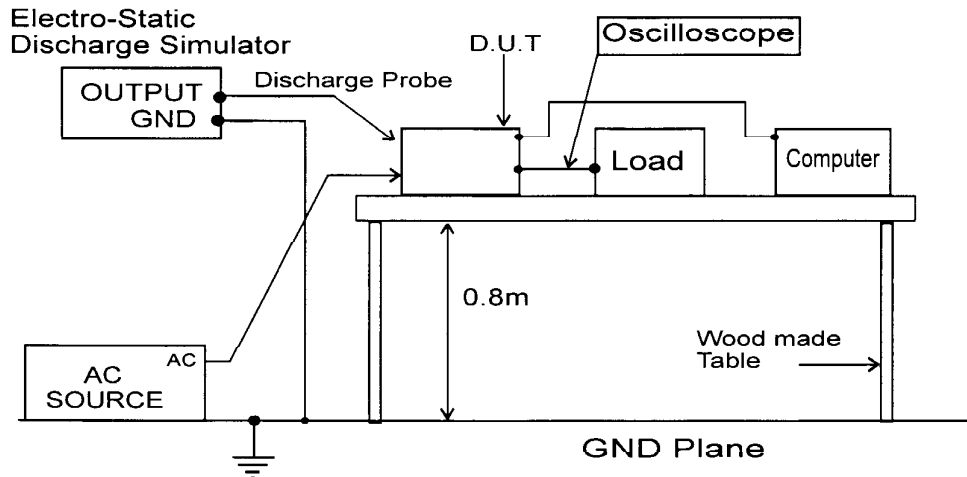
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The above data is typical value data.  
The values are considered to be actual capability data.

**NEMIC-LAMBDA**

**1. ELECTRO-STATIC DISCHARGE TEST**  
 (IEC1000-4-2)  
**M O D E L : ZUP- 400**

- (1) Equipment used  
 SCHAFFNER NSG435  
 Discharge resistance : 330 Ohm Capacity : 150 pF
- (2) Test conditions  
 Input voltage : Rated                      Output voltage : Rated  
 Output current : 100%                      Polarity : +,-  
 Number of tests : 10 times                      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 not to exceed  $\pm 5\%$  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

| Contact Discharge (kV) | ZUP6-66 | ZUP36-12 | ZUP60-7 | Air Discharge (kV) | ZUP6-66 | ZUP36-12 | ZUP60-7 |
|------------------------|---------|----------|---------|--------------------|---------|----------|---------|
| <b>2</b>               | PASS    | PASS     | PASS    | <b>2</b>           | PASS    | PASS     | PASS    |
| <b>4</b>               | PASS    | PASS     | PASS    | <b>4</b>           | PASS    | PASS     | PASS    |

**2.ELECTROMAGNETIC RADIATION SUSCEPTIBILITY TEST  
(IEC1000-4-3)  
M O D E L : ZUP- 400**

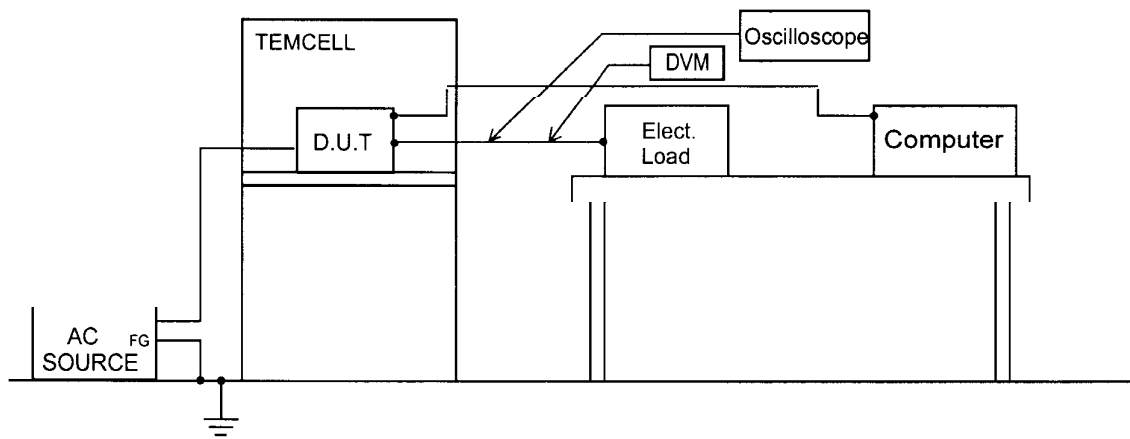
**(1) Equipment used**

Radiated immunity test chamber: 1JTEMCELL,Wayne Kerr  
 Electronic load: PLZ1003W , KIKUSUI  
 Oscilloscope: 3365A , PHILIPS  
 DVM: 8840A, FLUKE

**(2) Test conditions**

Input voltage : Rated                      Output voltage : Rated  
 Output current : 100%                      Amplitude Modulated: 80%, 1KHz  
 Electromagnetic                              Ambient temperature: 25°C  
 Frequency: 80~1000MHz

Sweep Condition: 1.5 x 10<sup>-3</sup> Decade/Second, 1.0 Second Hold  
 Test Angle: Top/Botton, Both Sides, Front/Back



**(3) Acceptable conditions**

1. Output voltage regulation not to exceed  $\pm 5\%$  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**

| Radiation Field Strength (V/m) | ZUP6-66 | ZUP36-12 | ZUP60-7 |
|--------------------------------|---------|----------|---------|
| 1                              | PASS    | PASS     | PASS    |
| 2                              | PASS    | PASS     | PASS    |
| 3                              | PASS    | PASS     | PASS    |

**3. ELECTRICAL FAST TRANSIENT BURST TEST  
(IEC1000-4-4)**

**M O D E L : ZUP- 400**

**(1) Equipment used**

EFT/B Generator: SCHAFFNER NSG2025

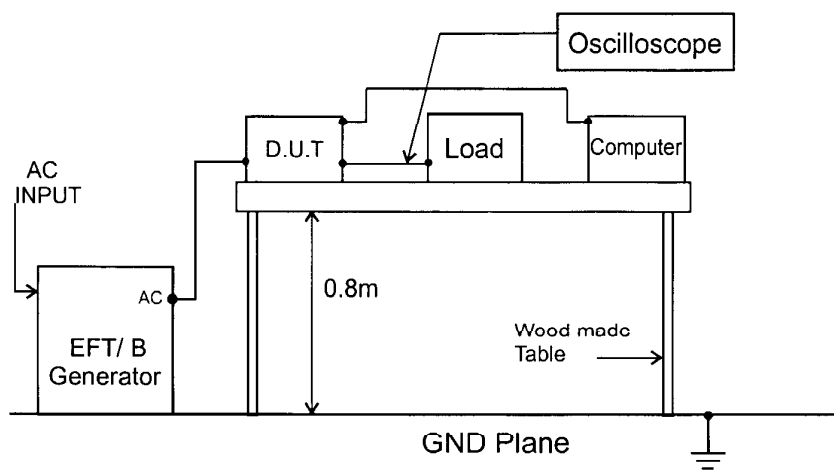
**(2) Test conditions**

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

**(3) Test method and Device test point**

N,L,FG

Apply to N,L,FG separately, as well as, all at the same time.



**(4) Acceptable conditions**

1. Output voltage regulation not to exceed  $\pm 5\%$  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**

| Test Voltage (kV) | Repetition Rate(kHz) | ZUP6-66 | ZUP36-12 | ZUP60-7 |
|-------------------|----------------------|---------|----------|---------|
| 0.5               | 5                    | PASS    | PASS     | PASS    |
| 1                 | 5                    | PASS    | PASS     | PASS    |
| 2                 | 5                    | PASS    | PASS     | PASS    |

**3. ELECTRICAL FAST TRANSIENT BURST TEST  
(IEC1000-4-4)**

**M O D E L : ZUP- 400**

**(1) Equipment used**

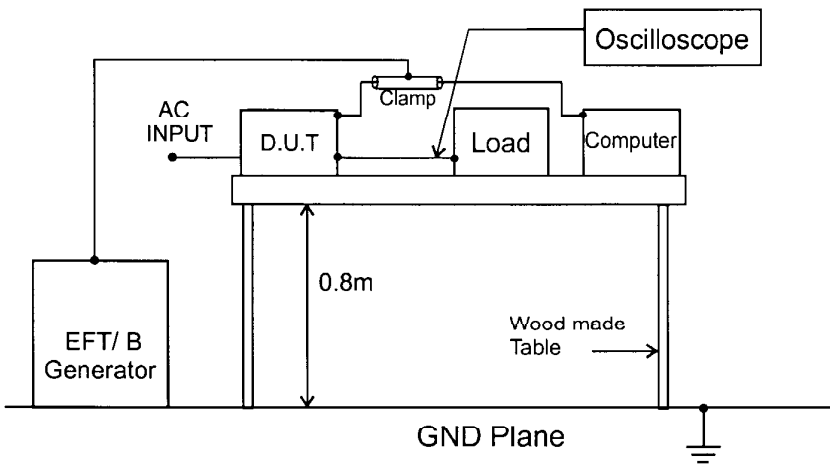
EFT/B Generator: SCHAFFNER NSG2025

**(2) Test conditions**

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

**(3) Test method and Device test point**

Communication lines



**(4) Acceptable conditions**

1. Output voltage regulation not to exceed  $\pm 5\%$  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**

| Test Voltage (kV) | Repetition Rate(kHz) | ZUP6-66 | ZUP36-12 | ZUP60-7 |
|-------------------|----------------------|---------|----------|---------|
| 0.5               | 5                    | PASS    | PASS     | PASS    |

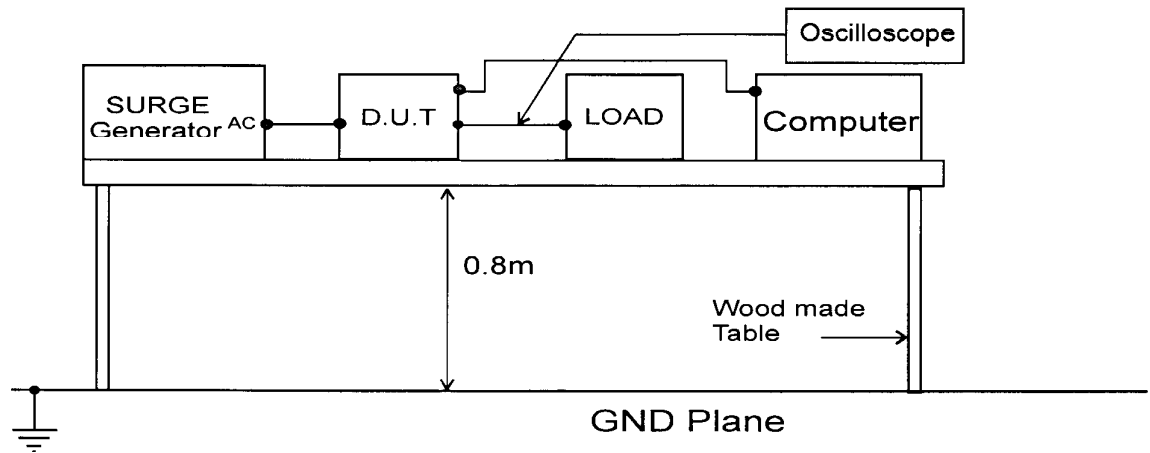
**4. SURGE TEST**  
**(IEC1000-4-5)**  
**M O D E L : ZUP- 400**

**(1) Equipment used**

Surge Generator: SCHAFFNER - NSG651  
 Coupling impedance: Common - 12 OHm  
                                   Normal - 2 OHm  
 Coupling capacitance: Common - 9uF  
                                   Normal - 18uF  
 Coupling network: SCHAFFNER - CDN110

**(2) Test method and device test point**

|                 |            |                      |                |
|-----------------|------------|----------------------|----------------|
| Input Voltage:  | Rated      | Output Voltage:      | Rated          |
| Output Current: | 100%       | Number of tests:     | 5 times        |
| Polarity:       | +, -       | Mode:                | Common, Normal |
| Phase:          | 0, 90 DEG. | Ambient Temperature: | 25 C           |



**(4) Acceptable conditions**

1. Output voltage regulation not to exceed  $\pm 5\%$  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**

| Test Voltage (kV)<br>Common | ZUP6-66 | ZUP36-12 | ZUP60-7 | Test Voltage (kV)<br>Normal | ZUP6-66 | ZUP36-12 | ZUP60-7 |
|-----------------------------|---------|----------|---------|-----------------------------|---------|----------|---------|
| 0.5                         | PASS    | PASS     | PASS    | 0.5                         | PASS    | PASS     | PASS    |
| 1.0                         | PASS    | PASS     | PASS    | 1                           | PASS    | PASS     | PASS    |
| 2.0                         | PASS    | PASS     | PASS    |                             |         |          |         |

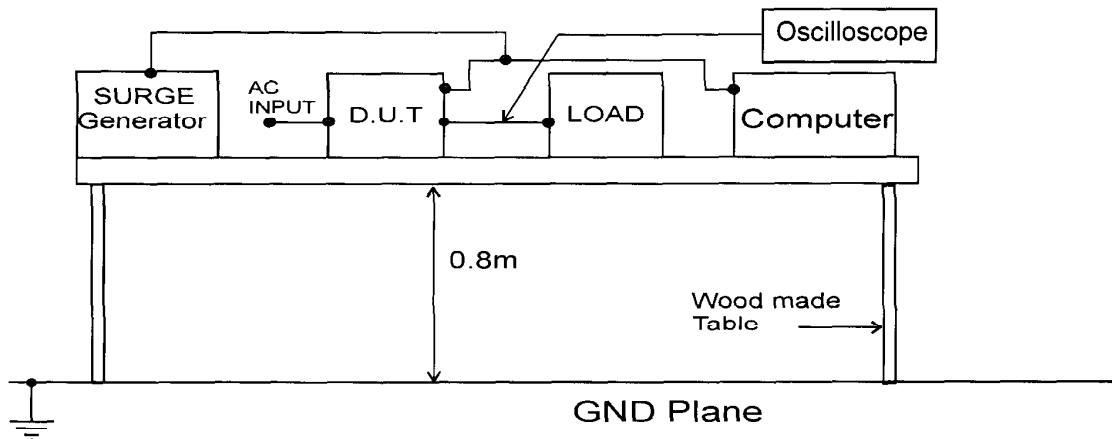
4. SURGE TEST  
(IEC1000-4-5)  
MODEL : ZUP- 400

(1) Equipment used

Surge Generator: SCHAFFNER - NSG651  
Coupling impedance: Common - 12 OHm  
Normal - 2 OHm  
Coupling capacitance: Common - 9uF  
Normal - 18uF  
Coupling network: SCHAFFNER - CDN110

(2) Test method and device test point communication lines

Input Voltage: Rated                      Output Voltage: Rated  
Output Current: 100%                      Number of tests: 5 times  
Polarity: +, -                                  Mode: Common.  
  
Phase: 0, 90 DEG.                      Ambient Temperature: 25°C



(4) Acceptable conditions

1. Output voltage regulation not to exceed  $\pm 5\%$  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

| Test Voltage (kV)<br>Common | ZUP6-66 | ZUP36-12 | ZUP60-7 |
|-----------------------------|---------|----------|---------|
| 0.5                         | PASS    | PASS     | PASS    |
| 1.0                         | PASS    | PASS     | PASS    |



**5. CONDUCTED SUSCEPTIBILITY TEST**

(IEC1000-4-6)

**M O D E L : ZUP- 400**

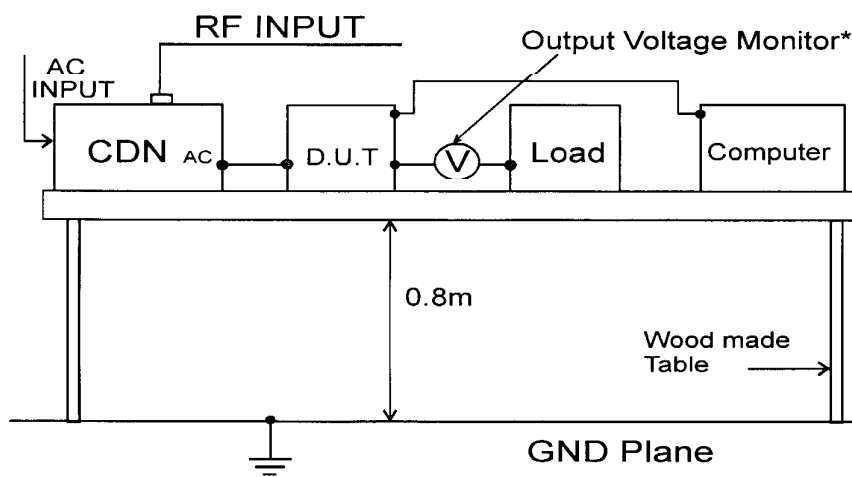
(1) Equipment used

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

(2) Test conditions

|                      |               |                  |              |
|----------------------|---------------|------------------|--------------|
| Input Voltage:       | Rated         | Output Voltage:  | Rated        |
| Output Current:      | 100%          | Electromagnetic  |              |
|                      |               | Frequency:       | 150KHz~80MHz |
| Sweep Condition:     | 1.0% Step Up, | 2.0 Seconds Hold |              |
| Ambient Temperature: | 25°C          |                  |              |

(3) Test method



\*Used Oscilloscope or Analog Voltage Meter

(4) Acceptable conditions

1. Output voltage regulation not to exceed  $\pm 5\%$  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

| Voltage Level (V) | ZUP6-66 | ZUP36-12 | ZUP60-7 |
|-------------------|---------|----------|---------|
| 1                 | PASS    | PASS     | PASS    |
| 2                 | PASS    | PASS     | PASS    |
| 3                 | PASS    | PASS     | PASS    |

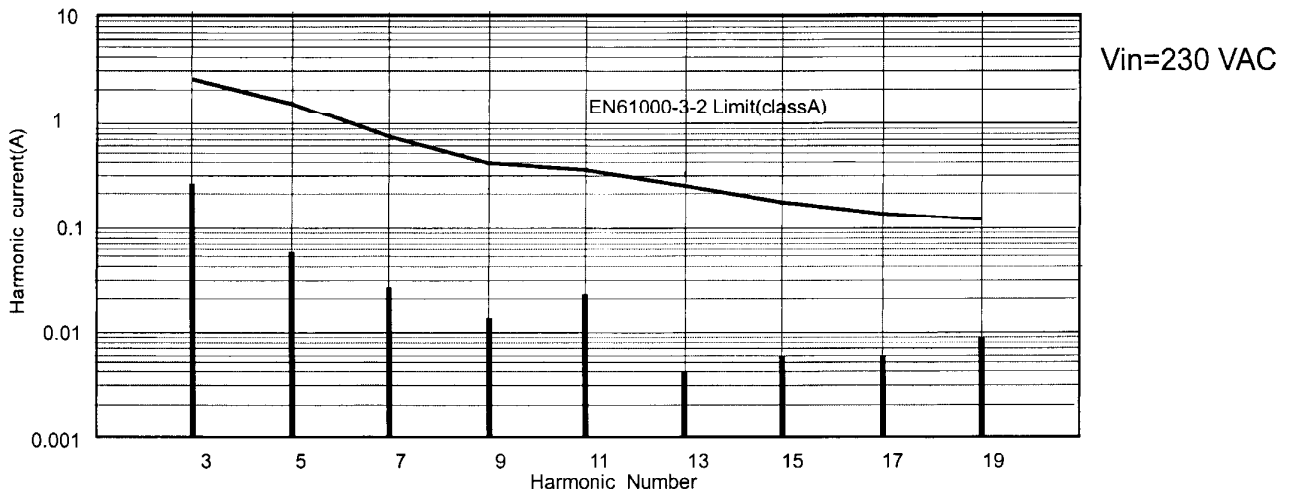
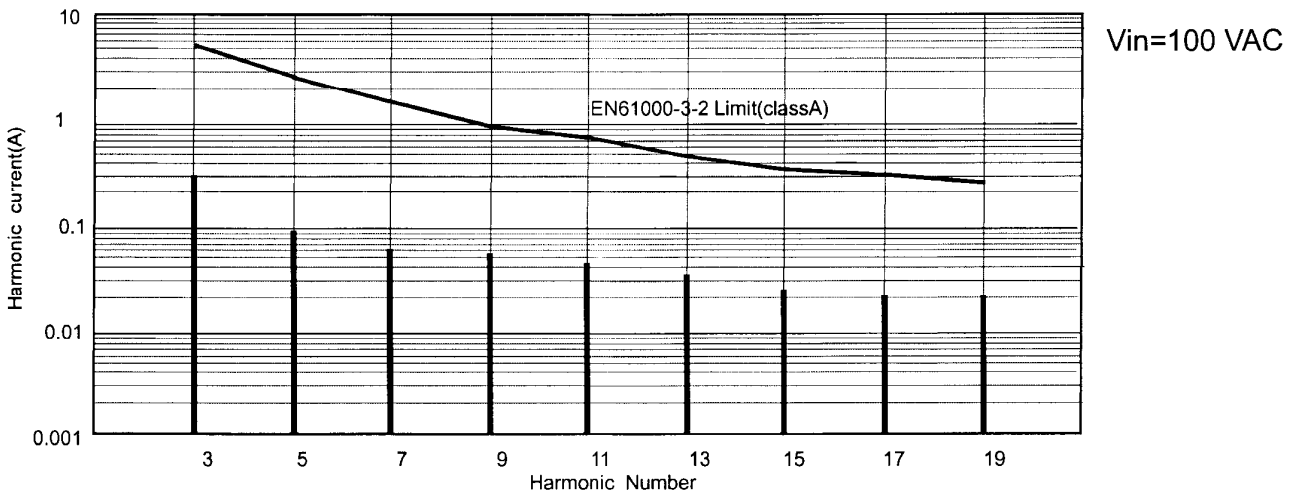
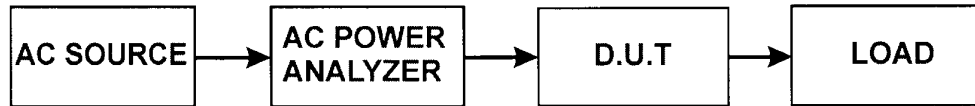
1. INPUT CURRENT HARMONICS TEST  
 (IEC1000-3-2, Class A)  
 M O D E L : ZUP6-66

**ZUP- 400**

- (1) Equipment used  
 AC POWER ANALYSER :  
 PACS-1(CALIFORNIA INSTRUMENTS)  
 AC SOURCE:  
 5001 IX (CALIFORNIA INSTRUMENTS)

- (2) Test conditions  
 Input voltage: 100 VAC; 230 VAC  
 Output current: 100%

(3) Test method



| Vin     | Harmonics |       |       |       |       |       |       |       |       |
|---------|-----------|-------|-------|-------|-------|-------|-------|-------|-------|
|         | 3         | 5     | 7     | 9     | 11    | 13    | 15    | 17    | 19    |
| 100 VAC | 5.29      | 2.62  | 1.77  | 0.92  | 0.76  | 0.48  | 0.34  | 0.30  | 0.27  |
|         | 0.301     | 0.093 | 0.062 | 0.055 | 0.044 | 0.034 | 0.026 | 0.021 | 0.021 |
| 230 VAC | 2.30      | 1.14  | 0.77  | 0.40  | 0.33  | 0.21  | 0.15  | 0.13  | 0.12  |
|         | 0.258     | 0.056 | 0.026 | 0.014 | 0.022 | 0.004 | 0.006 | 0.006 | 0.009 |

Input Current Harmonics IEC1000-3-2 limit

Input Current Harmonics -Measurement