COSEL

TEST DATA OF UMA30F-24

Regulated DC Power Supply
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CONTENTS

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Model	UMA30F-24
Item	Input Current (by Load Current)
Object	+24V1.3A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

△ —— Input Volt. 115V
- - -□- - - Input Volt. 230V
-·-○-·- Input Volt. 264V

2.Values

Load Current [A]	Input Current [A]		
	Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]
0.00	0.011	0.020	0.022
0.26	0.136	0.087	0.079
0.52	0.242	0.150	0.136
0.78	0.343	0.210	0.191
1.04	0.445	0.269	0.245
1.30	0.548	0.329	0.297
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	UMA30F-24
Item	Efficiency (by Load Current)
Object	+24V1.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

△ Input Volt. 115V
◻ Input Volt. 230V
○ Input Volt. 264V

2.Values

Load Current [A]	Efficiency [%]		
	Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]
0.00	-	-	-
0.26	87.1	85.8	85.2
0.52	87.8	87.6	87.3
0.78	88.0	88.2	87.1
1.04	87.9	88.5	87.9
1.30	87.4	88.5	88.6
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	UMA30F-24
Item	Power Factor (by Load Current)
Object	+24V1.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

△ Input Volt. 115V
□ Input Volt. 230V
○ Input Volt. 264V

Power Factor vs Load Current [A]

2.Values

Load Current [A]	Power Factor		
	Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]
0.00	0.093	0.038	0.033
0.26	0.454	0.361	0.348
0.52	0.511	0.413	0.399
0.78	0.540	0.441	0.427
1.04	0.556	0.458	0.442
1.30	0.569	0.469	0.451
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

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Model	UMA30F-24
Item	Inrush Current
Object	+24V1.3A

Temperature   25°C
Testing Circuitry   Figure A

Input
Current
[20A/div]

Input
Voltage
[200V/div]

Time   [50ms/div]
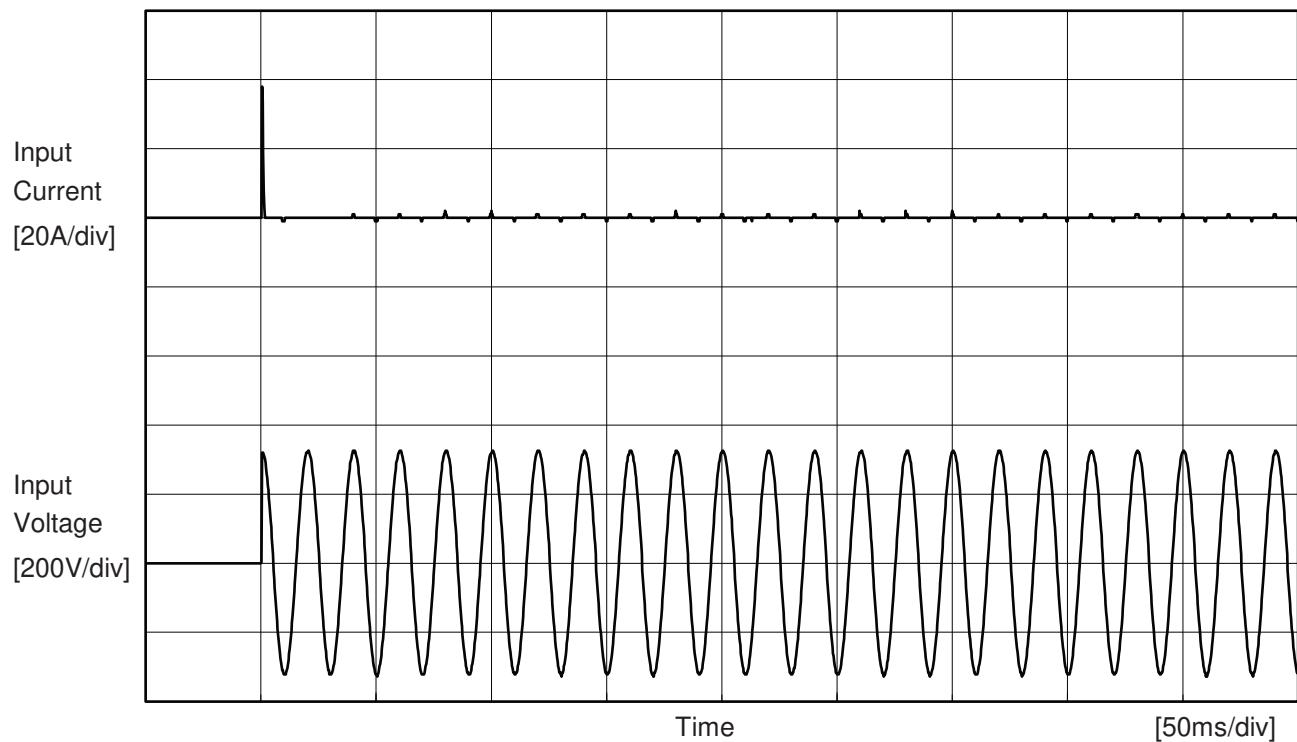
Input Voltage	230 V
Frequency	50 Hz
Load	100 %
Primary inrush current	38.0 A
Secondary inrush current	2.0 A

Primary inrush current   Secondary inrush current

- 4 -   BC-11914

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Model	UMA30F-24
Item	Leakage Current
Object	+24V1.3A

Temperature 25°C
Testing Circuitry Figure C

1.Results

[mA]

Standards	Testing Circuitry	Measuring Method	Input Volt.			Note
			115 [V]	230 [V]	264 [V]	
IEC60601-1	Figure C-1	Both phases	0.05	0.11	0.12	Operation
		One of phases	0.10	0.21	0.24	Stand by
IEC62368-1	Figure C-2	Both phases	0.05	0.11	0.13	Operation
		One of phases	0.10	0.21	0.25	Stand by
	Figure C-3	Both phases	0.05	0.11	0.12	Operation
		One of phases	0.10	0.21	0.25	Stand by

The value for "One of phases" is the reference value only.

2.Condition
Leakage current value is concluded after measuring both phases of
AC input and by choosing the larger one.

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Model	UMA30F-24
Item	Line Regulation
Object	+24V1.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

2.Values

--- ⊟ --- Load 50%
—△— Load 100%

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	24.271	-
100	24.271	-
115	24.271	24.258
132	24.271	24.258
170	24.271	24.259
200	24.271	24.259
230	24.271	24.259
264	24.271	24.259
--	-	-

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Model	UMA30F-24

Temperature 25°C
Testing Circuitry Figure A

Item	Load Regulation
Object	+24V1.3A

1.Graph

——△——	Input Volt.	115V
- - -☐- - -	Input Volt.	230V
—·—○—··	Input Volt.	264V

2.Values

Load Current [A]	Output Voltage [V]		
	Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]
0.00	24.286	24.288	24.285
0.26	24.282	24.282	24.282
0.52	24.277	24.277	24.277
0.78	24.271	24.271	24.271
1.04	24.266	24.266	24.266
1.30	24.260	24.260	24.261
--	--	--	--
--	--	--	--
--	--	--	--
--	--	--	--
--	--	--	--

Temperature 25°C
Testing Circuitry Figure B

Item	Ripple-Noise
Object	+24V1.3A

1.Graph

Input Voltage 230V
Load 100%

20[mV/div]

10[ms/div]

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Model	UMA30F-24
Item	Dynamic Load Response
Object	+24V1.3A

Temperature 25°C
Testing Circuitry Figure A

Input Volt. 230 V
Cycle 1000 ms

t1,t2 = 50 μ s

Load Current

t1

t2

Min.Load (0A)←→
Load 100% (1.3A)

200 mV/div

10 ms/div

10 ms/div

Load 50% (0.65A)←→
Load 100% (1.3A)

100 mV/div

10 ms/div

10 ms/div

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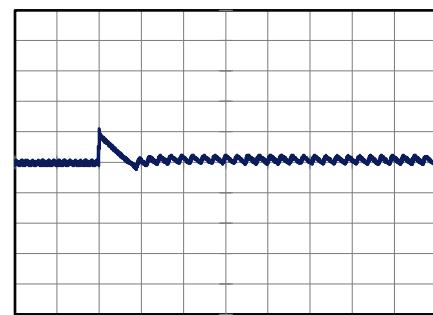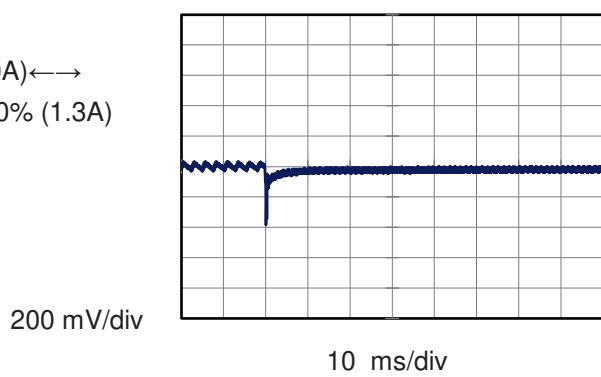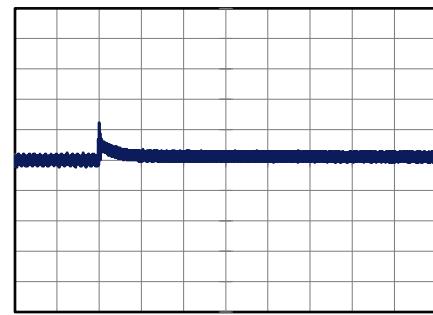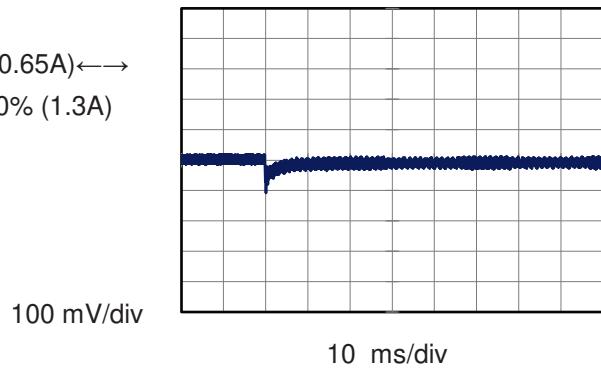
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Model	UMA30F-24
Item	Rise and Fall Time
Object	+24V1.3A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

Input Volt. 230 V

Output Volt. [5V/div]

Load 50%

0

Output Volt. [5V/div]

Load 100%

0

Input Volt. [200V/div]

0

Time   [50ms/div]   Time   [50ms/div]
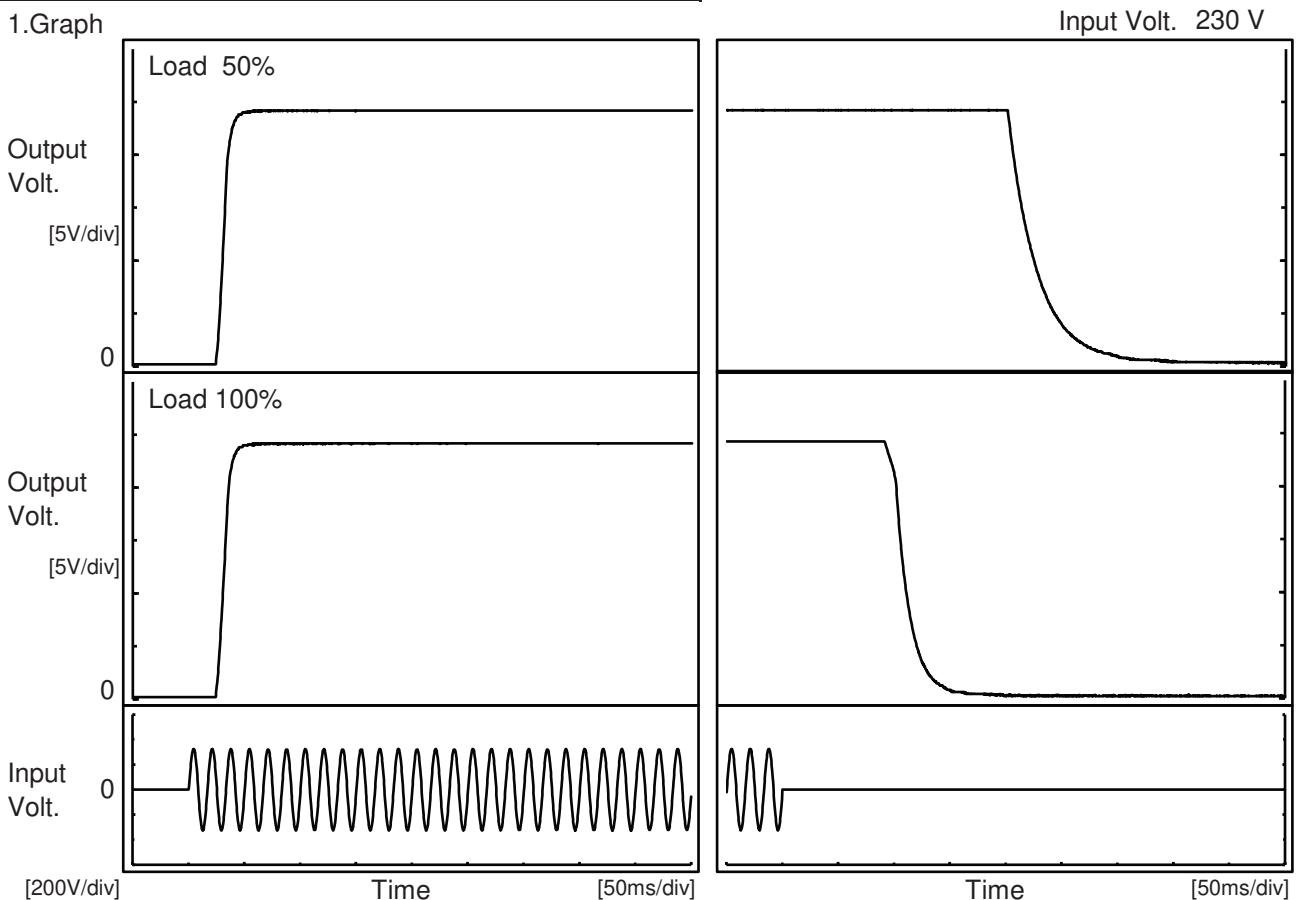
2.Values

[ms]

Load \ Time	Td	Tr	Ts	Th	Tf
50 %	26.8	11.3	38.1	204.0	57.0
100 %	26.8	11.5	38.3	99.0	29.8

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Model	UMA30F-24
Item	Hold-Up Time
Object	+24V1.3A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

2.Values

--- ⊟ --- Load 50%
——△—— Load 100%

Hold-Up Time [ms] vs Input Voltage [V]

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
85	22	-
100	33	-
115	45	19
132	61	25
170	107	46
200	151	67
230	204	94
264	273	128
--	-	-

This duration covers from Shut-off of input
voltage to the moment when output voltage
descends to the rated range of voltage accuracy.

BC-11914

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Model	UMA30F-24
Item	Instantaneous Interruption Compensation
Object	+24V1.3A

Temperature   25°C
Testing Circuitry   Figure A

1.Graph

      △ Input Volt.   115V
      □ Input Volt.   230V
      ○ Input Volt.   264V

2.Values

Load Current	Time [ms]		
[A]	Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]
0.00	-	-	-
0.26	117	506	676
0.52	57	255	340
0.78	37	169	226
1.04	27	123	168
1.30	19	93	128
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-11914

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Model	UMA30F-24
Item	Overcurrent Protection
Object	+24V1.3A

Temperature 25°C
Testing Circuitry Figure A

1.Graph

Input Volt. 115V
Input Volt. 230V
Input Volt. 264V

Note: Slanted line shows the range of the rated load current.

Overcurrent protection is Hiccup mode.

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]
24	1.72	1.67	1.72
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

BC-11914

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Model	UMA30F-24
Item	Ambient Temperature Drift
Object	+24V1.3A

Testing Circuitry   Figure A

1.Values   Load 100%

Ambient Temperature[℃]	Output Voltage [V]		
	Input Volt. 115V	Input Volt. 230V	Input Volt. 264V
-20	24.153	24.154	24.154
25	24.256	24.256	24.256
50	24.290	24.290	24.290

Item	Minimum Input Voltage for Regulated Output Voltage
Object	+24V1.3A

Testing Circuitry   Figure A

1.Values

Ambient Temperature[℃]	Input Voltage [V]	
	Load 50%	Load 100%
-20	34	65
25	33	67
50	33	68

Item	Overvoltage Protection
Object	+24V1.3A

Testing Circuitry   Figure A

1.Values   Load 0%

Ambient Temperature[℃]	Operating Point [V]	
	Input Volt. 115V	Input Volt. 264V
-20	30.84	30.42
25	31.69	31.69
50	32.38	32.32

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Figure A

Data Acquisition/Control Unit

Figure B

(Ceramic capacitor)

C1 = 0.1 μF

(Electrolytic capacitor)

C2 = 47 μF

$$\text{Leakage Current Value [A]} = \frac{\text{Effective Value of Voltmeter[V]}}{1k\ [\Omega]}$$

Figure C-1 (IEC60601-1)

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AC Input Line → AC Voltmeter

Power Supply

FG

DC Ammeter

Adjustable Load

500Ω±0.1%

1.5kΩ±0.1%

10kΩ±0.1%

0.22μF±1.0%

0.022μF±1.0%

Effective value Voltmeter

$$\text{Leakage Current Value } [A] = \frac{\text{Effective Value of Voltmeter[V]}}{500 \ [\Omega]}$$
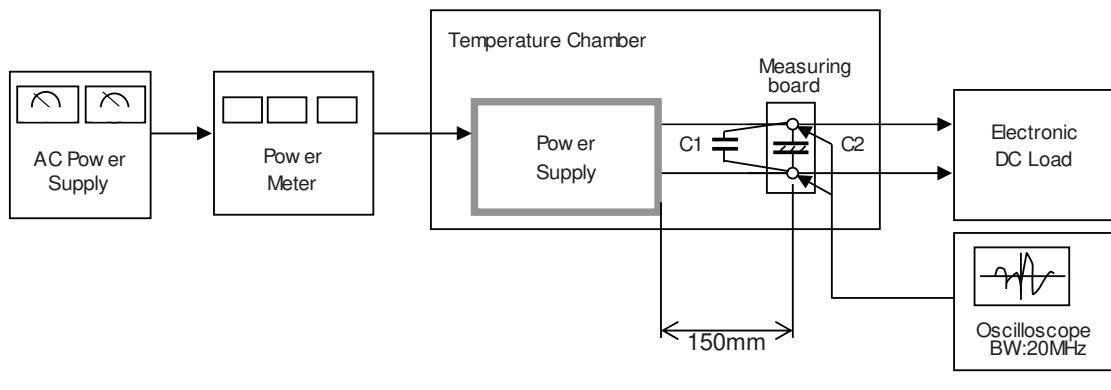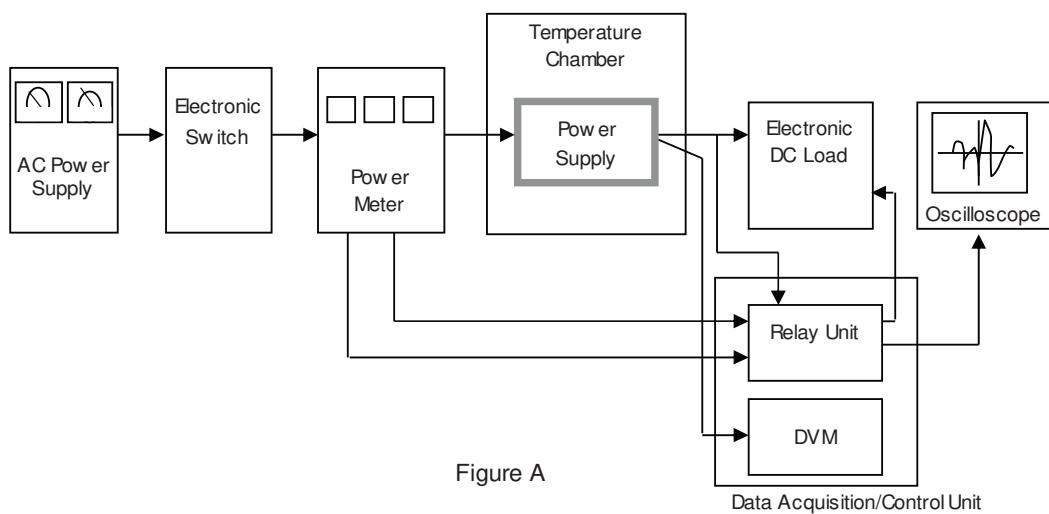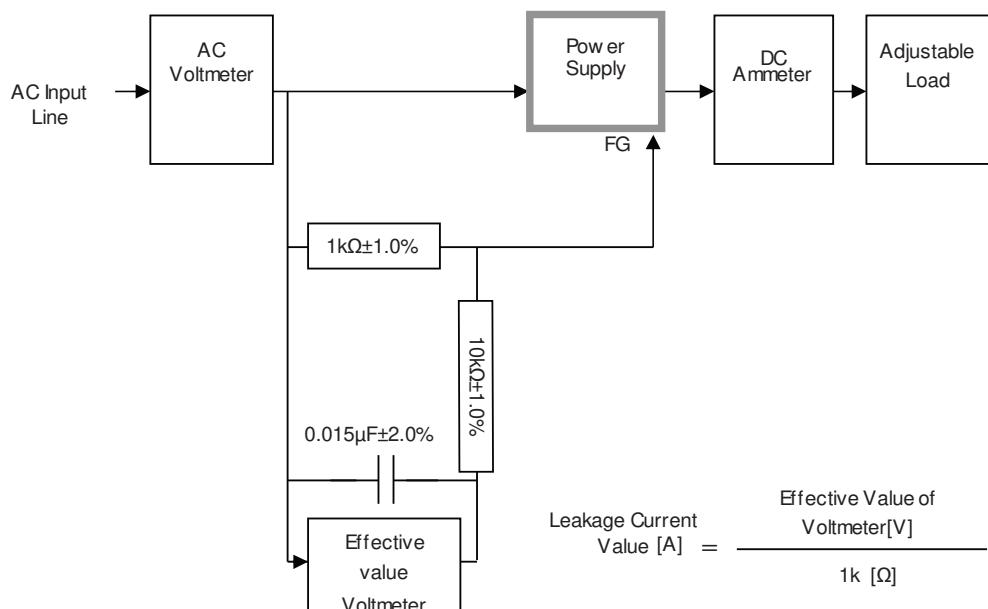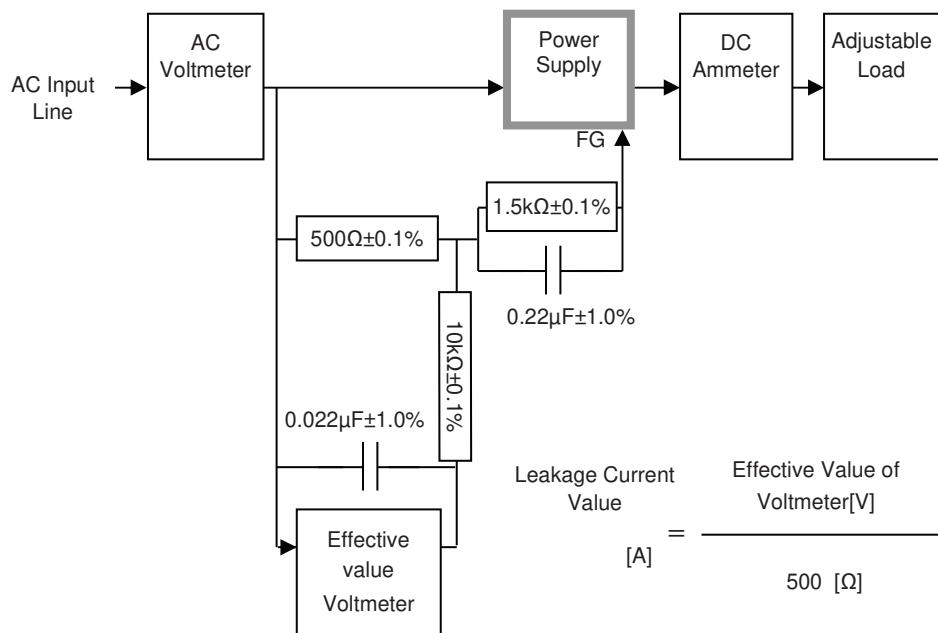
Figure C-2 (IEC62368-1 refer to IEC60990 Fig.4)

AC Input Line → AC Voltmeter

Power Supply

FG

DC Ammeter

Adjustable Load

500Ω±0.1%

1.5kΩ±0.1%

10kΩ±0.1%

0.22μF±1.0%

9100pF±1.0%

20kΩ±0.1%

6200pF±1.0%

Effective value Voltmeter

$$\text{Leakage Current Value } [A] = \frac{\text{Effective Value of Voltmeter[V]}}{500 \ [\Omega]}$$
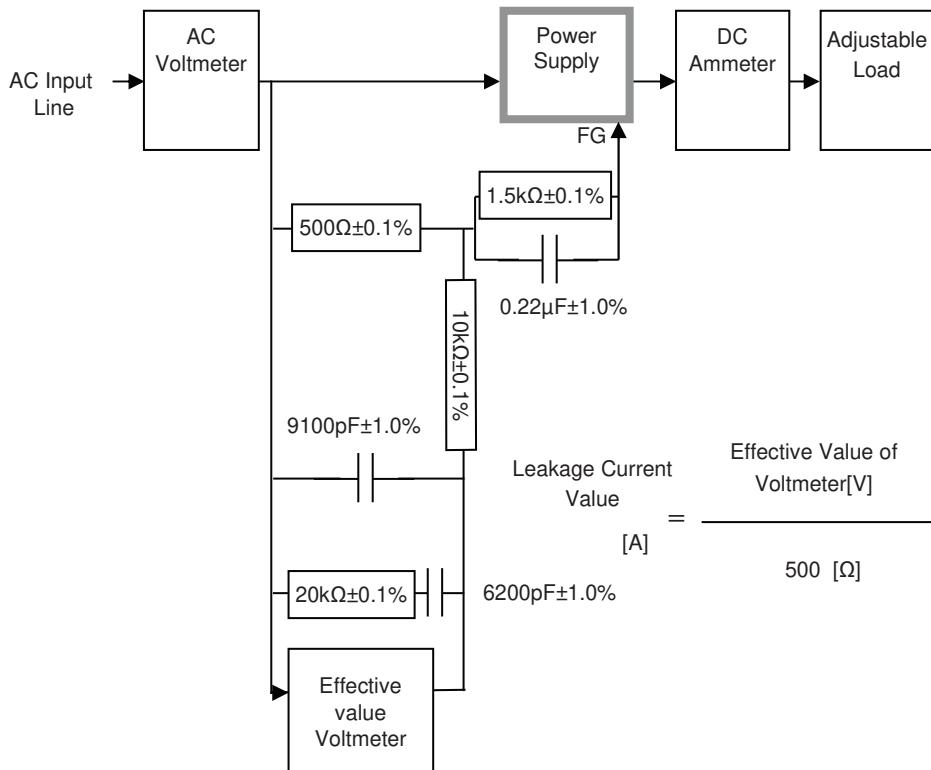
Figure C-3 (IEC62368-1 refer to IEC60990 Fig.5)

BC-11914