



TEST DATA OF UMA60F-15

Regulated DC Power Supply
January 16, 2023

Approved by : Takashi Kajii
Design Manager

Prepared by : Jeonghoon Yi
Design Engineer

COSEL CO.,LTD.



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(Final Page 15)

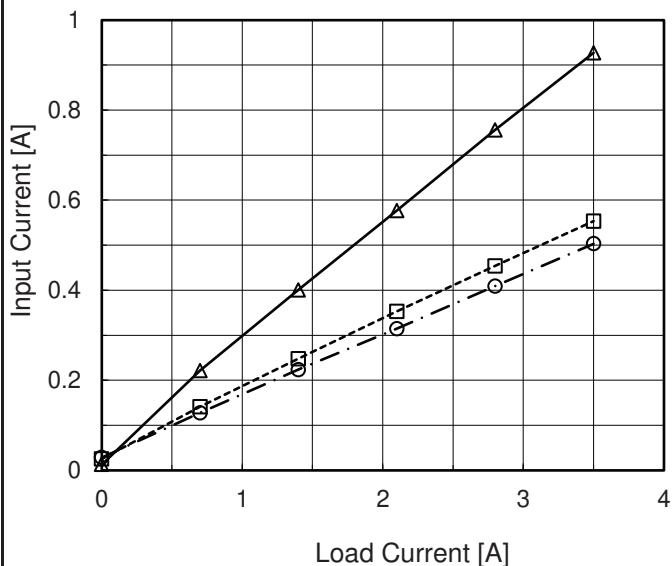
COSEL

Model	UMA60F-15
Item	Input Current (by Load Current)
Object	+15V3.5A

 Temperature 25°C
 Testing Circuitry Figure A

1.Graph

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



2.Values

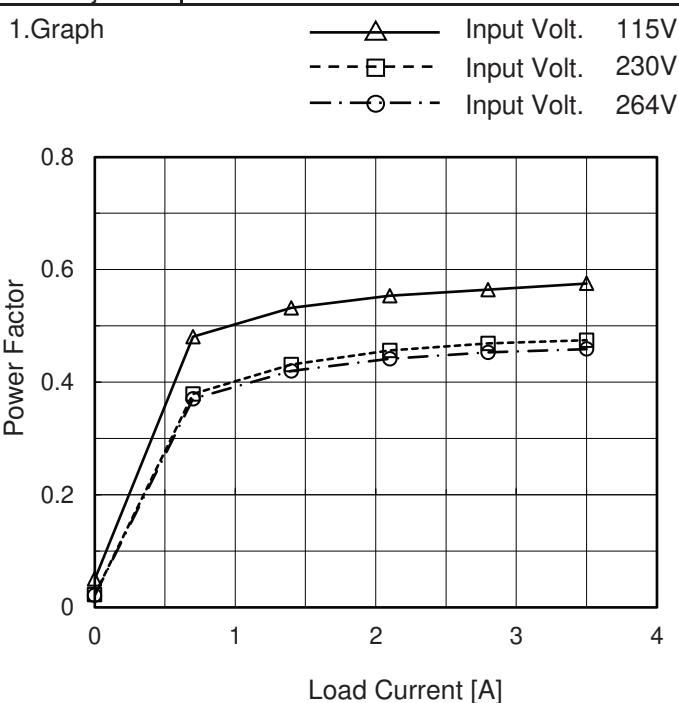
Load Current [A]	Input Current [A]		
	Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]
0.0	0.013	0.026	0.029
0.7	0.222	0.142	0.128
1.4	0.401	0.248	0.224
2.1	0.577	0.353	0.315
2.8	0.756	0.454	0.409
3.5	0.927	0.553	0.503
--	-	-	-
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COSEL

Model	UMA60F-15	Temperature	25°C																																																			
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Object	+15V3.5A																																																					
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<p>Graph showing Efficiency [%] vs Load Current [A]. The Y-axis ranges from 70 to 100 in increments of 10. The X-axis ranges from 0 to 4 in increments of 1. The legend indicates three input voltages: 115V (solid line with triangle markers), 230V (dashed line with square markers), and 264V (dash-dot line with circle markers). All curves show efficiency increasing with load current, with higher input voltages resulting in higher efficiency.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>115[V]</th> <th>230[V]</th> <th>264[V]</th> </tr> </thead> <tbody> <tr><td>0.7</td><td>86.8</td><td>86.1</td><td>84.9</td></tr> <tr><td>1.4</td><td>87.1</td><td>86.7</td><td>86.0</td></tr> <tr><td>2.1</td><td>87.2</td><td>86.5</td><td>87.3</td></tr> <tr><td>2.8</td><td>87.1</td><td>87.2</td><td>87.3</td></tr> <tr><td>3.5</td><td>87.1</td><td>88.4</td><td>87.6</td></tr> </tbody> </table>			Load Current [A]	115[V]	230[V]	264[V]	0.7	86.8	86.1	84.9	1.4	87.1	86.7	86.0	2.1	87.2	86.5	87.3	2.8	87.1	87.2	87.3	3.5	87.1	88.4	87.6																												
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COSEL

Model	UMA60F-15
Item	Power Factor (by Load Current)
Object	+15V3.5A

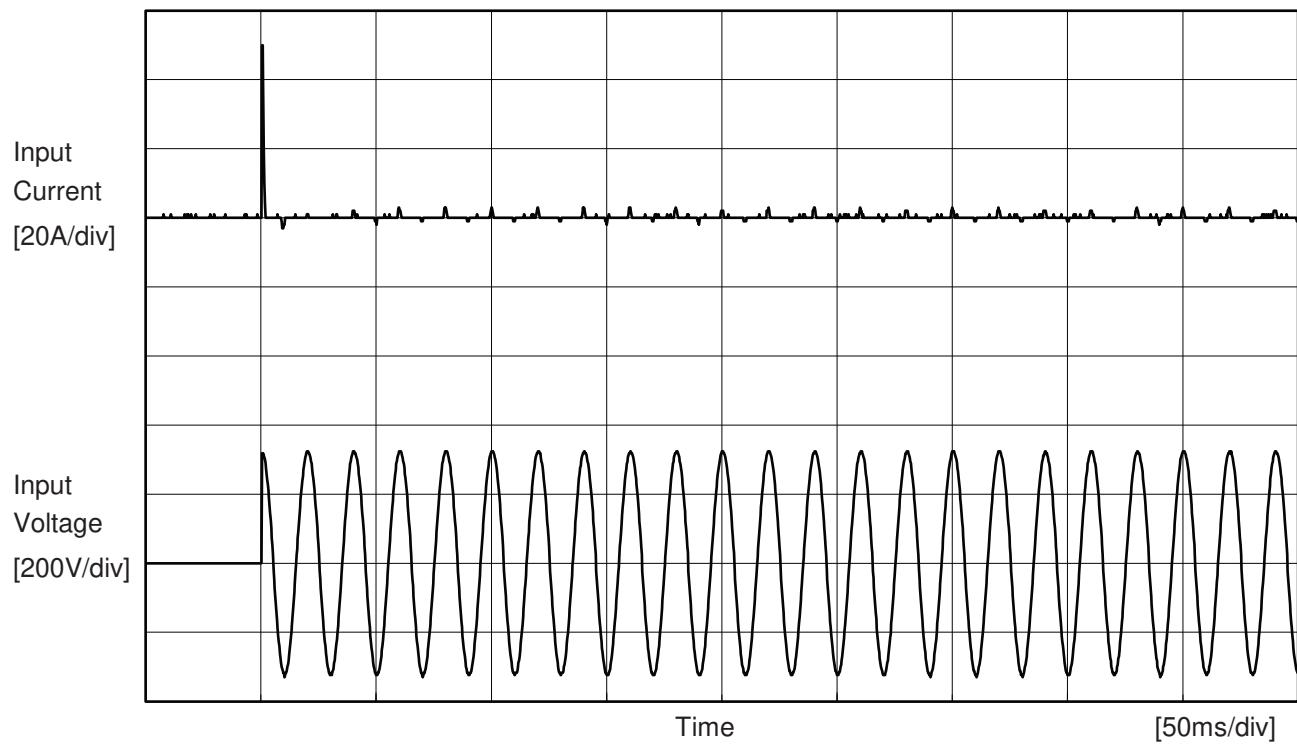
 Temperature 25°C
 Testing Circuitry Figure A


2.Values

Load Current [A]	Power Factor		
	Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]
0.0	0.050	0.023	0.022
0.7	0.481	0.379	0.370
1.4	0.532	0.432	0.420
2.1	0.554	0.457	0.441
2.8	0.565	0.469	0.453
3.5	0.575	0.475	0.459
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-
--	-	-	-

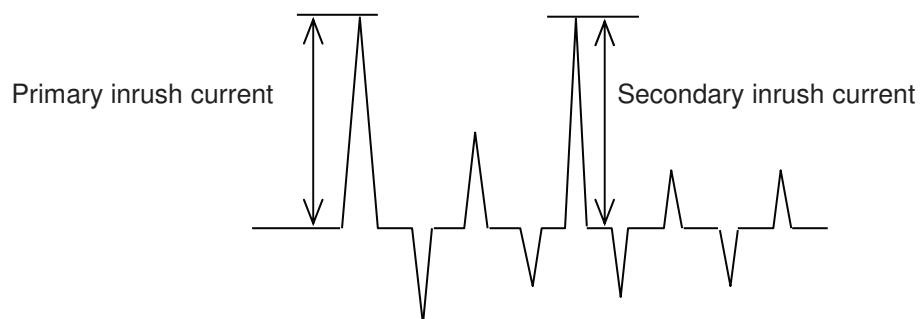
COSEL

Model	UMA60F-15	Temperature Testing Circuitry Figure A	25°C
Item	Inrush Current		
Object	+15V3.5A		



Input Voltage	230 V
Frequency	50 Hz
Load	100 %

Primary inrush current	50.0 A
Secondary inrush current	3.0 A





Model	UMA60F-15	Temperature	25°C
Item	Leakage Current	Testing Circuitry	Figure C
Object	+15V3.5A		

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	0.13	Operation
		One of phases	0.10	0.21	0.25	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	0.13	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

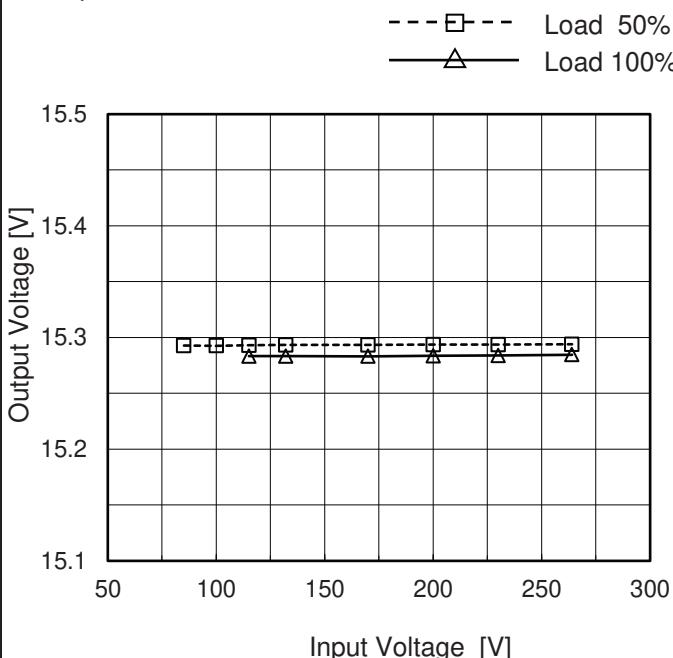
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

COSEL

Model	UMA60F-15
Item	Line Regulation
Object	+15V3.5A

 Temperature 25°C
 Testing Circuitry Figure A

1.Graph



2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
85	15.293	-
100	15.293	-
115	15.293	15.283
132	15.293	15.283
170	15.293	15.283
200	15.294	15.284
230	15.294	15.284
264	15.294	15.285
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COSEL

Model	UMA60F-15	Temperature	25°C																																																				
Item	Load Regulation	Testing Circuitry	Figure A																																																				
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1.Graph	<p>—△— Input Volt. 115V - - -□- - Input Volt. 230V - - -○- - Input Volt. 264V</p> <table border="1"> <caption>Data points estimated from Figure A graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>Output Voltage [V] (115V)</th> <th>Output Voltage [V] (230V)</th> <th>Output Voltage [V] (264V)</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>15.311</td><td>15.313</td><td>15.312</td></tr> <tr><td>0.7</td><td>15.307</td><td>15.308</td><td>15.307</td></tr> <tr><td>1.4</td><td>15.303</td><td>15.303</td><td>15.303</td></tr> <tr><td>2.1</td><td>15.298</td><td>15.298</td><td>15.298</td></tr> <tr><td>2.8</td><td>15.292</td><td>15.293</td><td>15.293</td></tr> <tr><td>3.5</td><td>15.287</td><td>15.287</td><td>15.287</td></tr> </tbody> </table>				Load Current [A]	Output Voltage [V] (115V)	Output Voltage [V] (230V)	Output Voltage [V] (264V)	0.0	15.311	15.313	15.312	0.7	15.307	15.308	15.307	1.4	15.303	15.303	15.303	2.1	15.298	15.298	15.298	2.8	15.292	15.293	15.293	3.5	15.287	15.287	15.287																							
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Item	Ripple-Noise	Temperature	25°C																																																				
Object	+15V3.5A	Testing Circuitry	Figure B																																																				
1.Graph	<p>Input Voltage 230V Load 100%</p>																																																						

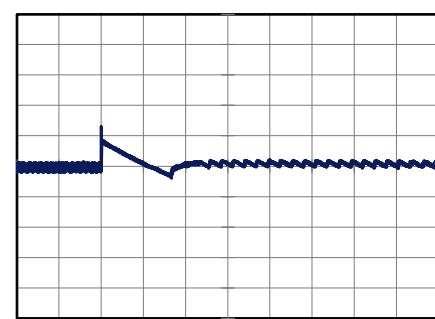
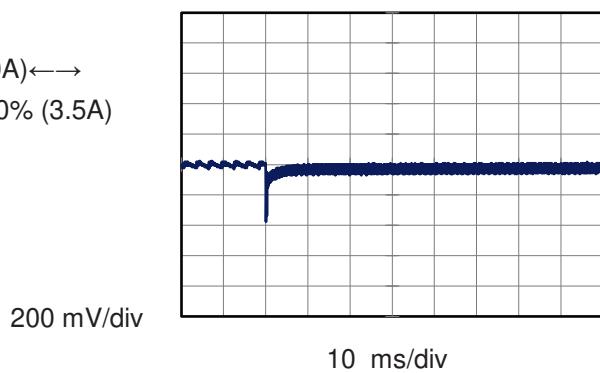
COSEL

Model	UMA60F-15	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+15V3.5A		

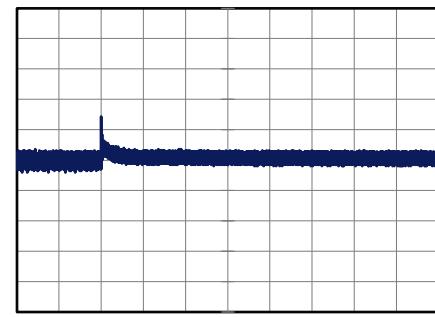
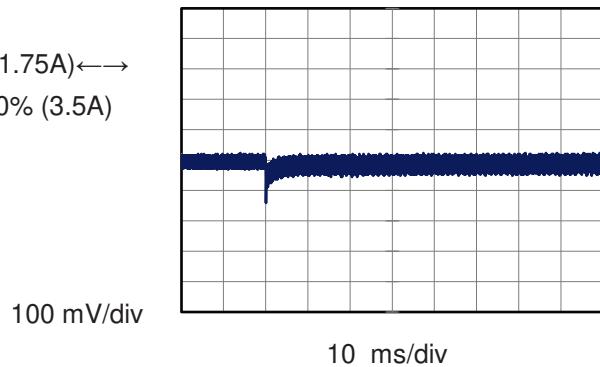
Input Volt. 230 V
 Cycle 1000 ms



Min.Load (0A)↔
 Load 100% (3.5A)



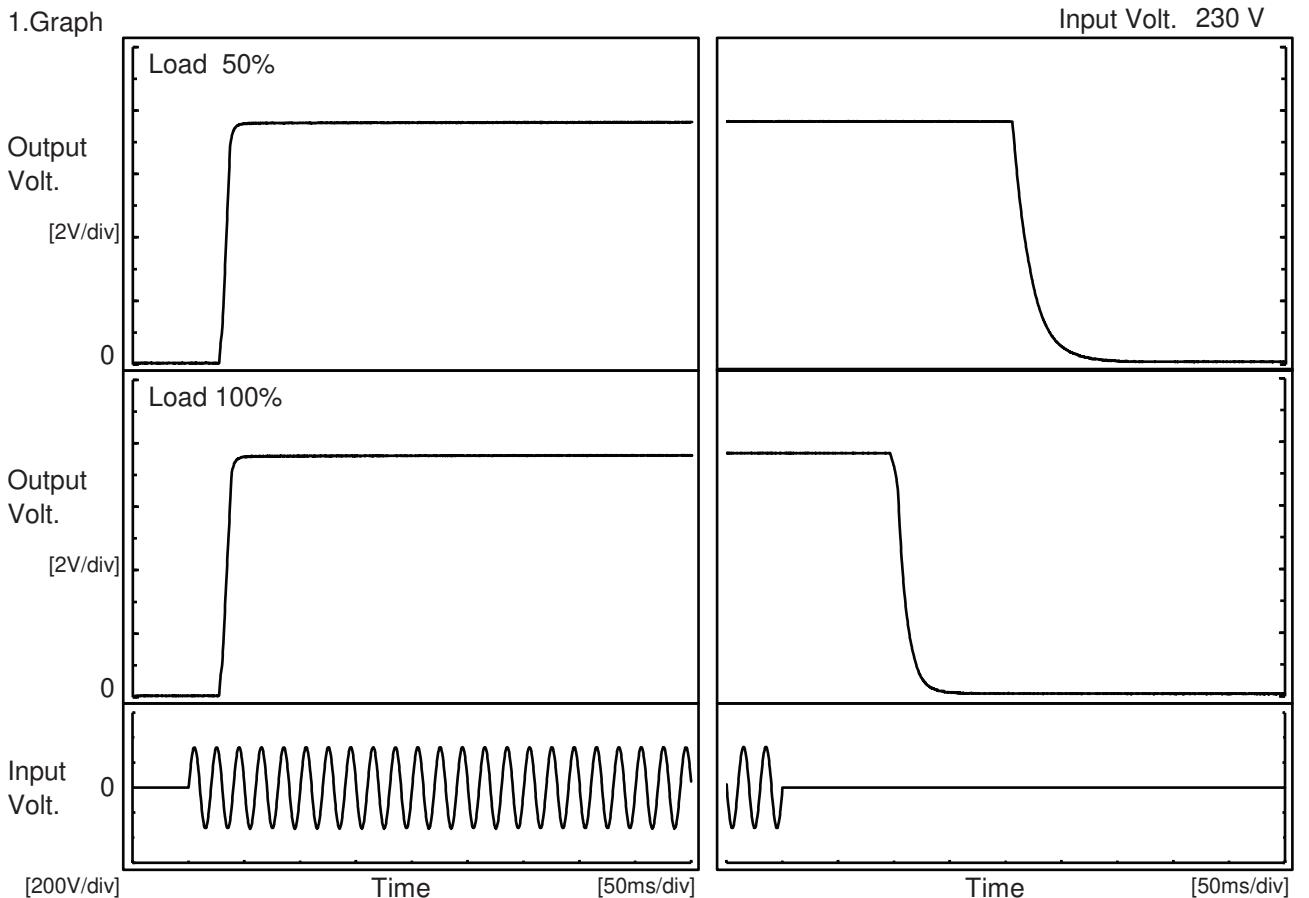
Load 50% (1.75A)↔
 Load 100% (3.5A)



COSEL

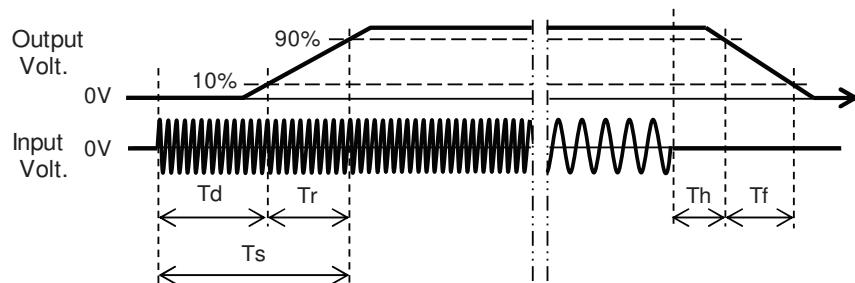
Model	UMA60F-15	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+15V3.5A		

1. Graph



2. Values

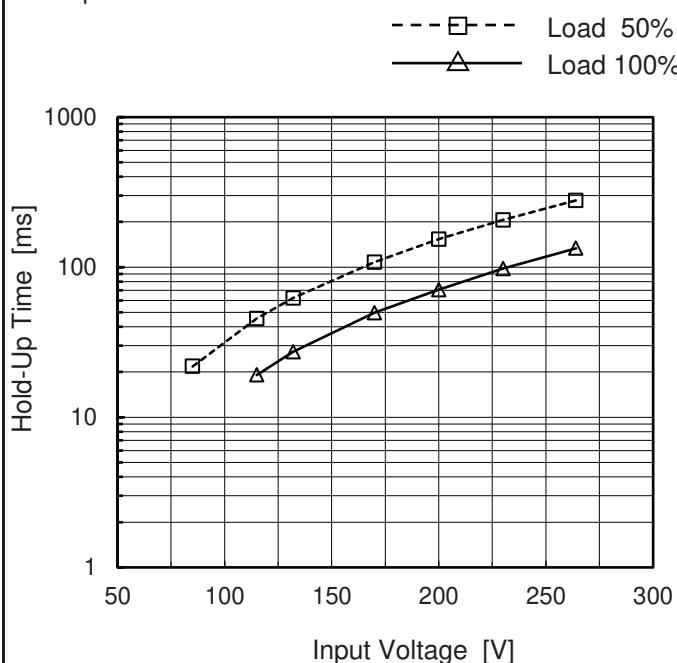
Load	Time	Td	Tr	Ts	Th	Tf	[ms]
50 %		29.3	8.0	37.3	207.8	35.8	
100 %		29.3	9.0	38.3	102.3	19.5	



COSEL

Model	UMA60F-15	Temperature	25°C
Item	Hold-Up Time	Testing Circuitry	Figure A
Object	+15V3.5A		

1.Graph



2.Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
85	22	-
100	33	-
115	46	19
132	62	27
170	108	50
200	154	71
230	207	98
264	279	134
--	-	-

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

COSEL

Model	UMA60F-15	Temperature	25°C																																																			
Item	Instantaneous Interruption Compensation	Testing Circuitry	Figure A																																																			
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COSEL

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<p>Note: Slanted line shows the range of the rated load current.</p> <p>Overcurrent protection is Hiccup mode.</p>			<table border="1"> <thead> <tr> <th rowspan="2">Output Voltage [V]</th> <th colspan="3">Load Current [A]</th> </tr> <tr> <th>Input Volt. 115[V]</th> <th>Input Volt. 230[V]</th> <th>Input Volt. 264[V]</th> </tr> </thead> <tbody> <tr><td>15</td><td>5.13</td><td>4.99</td><td>5.16</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>	Output Voltage [V]	Load Current [A]			Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]	15	5.13	4.99	5.16	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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Model	UMA60F-15	
Item	Ambient Temperature Drift	Testing Circuitry Figure A
Object	+15V3.5A	

1.Values

Load 100%

Ambient Temperature[°C]	Output Voltage [V]		
	Input Volt. 115V	Input Volt. 230V	Input Volt. 264V
-20	15.221	15.224	15.226
25	15.281	15.281	15.282
40	15.293	15.293	15.293

Item	Minimum Input Voltage for Regulated Output Voltage	Testing Circuitry Figure A
Object	+15V3.5A	

1.Values

Ambient Temperature[°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	35	56
25	35	57
40	34	56

Item	Overvoltage Protection	Testing Circuitry Figure A
Object	+15V3.5A	

1.Values

Load 0%

Ambient Temperature[°C]	Operating Point [V]	
	Input Volt. 115V	Input Volt. 264V
-20	18.79	18.75
25	19.42	19.42
40	19.56	19.69

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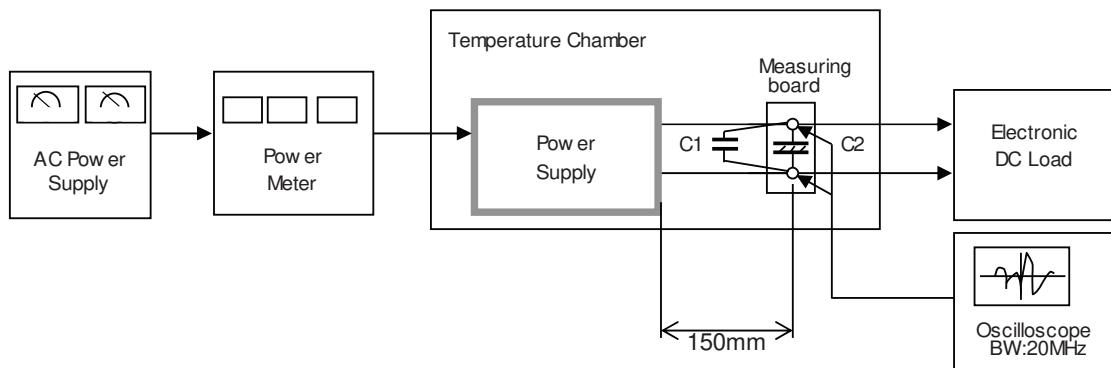
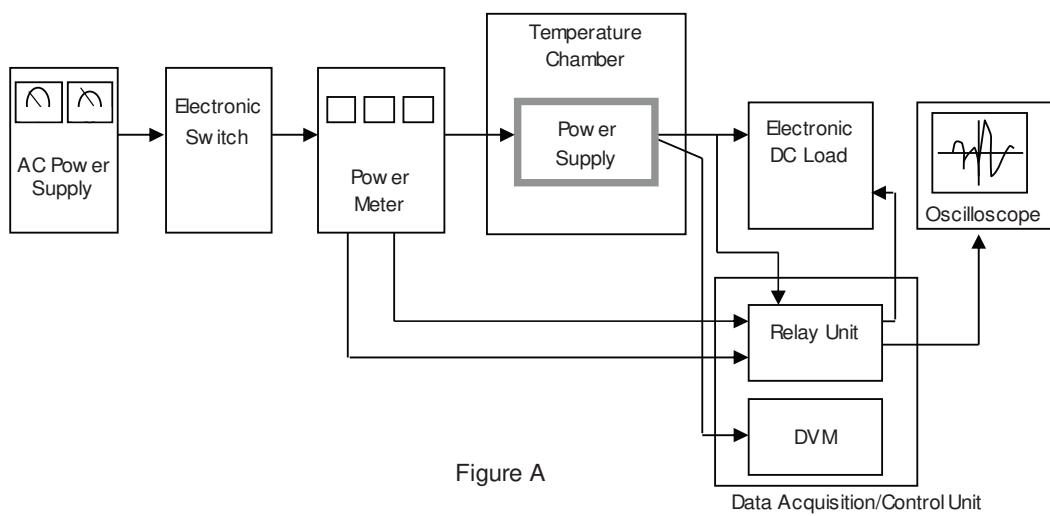


Figure B

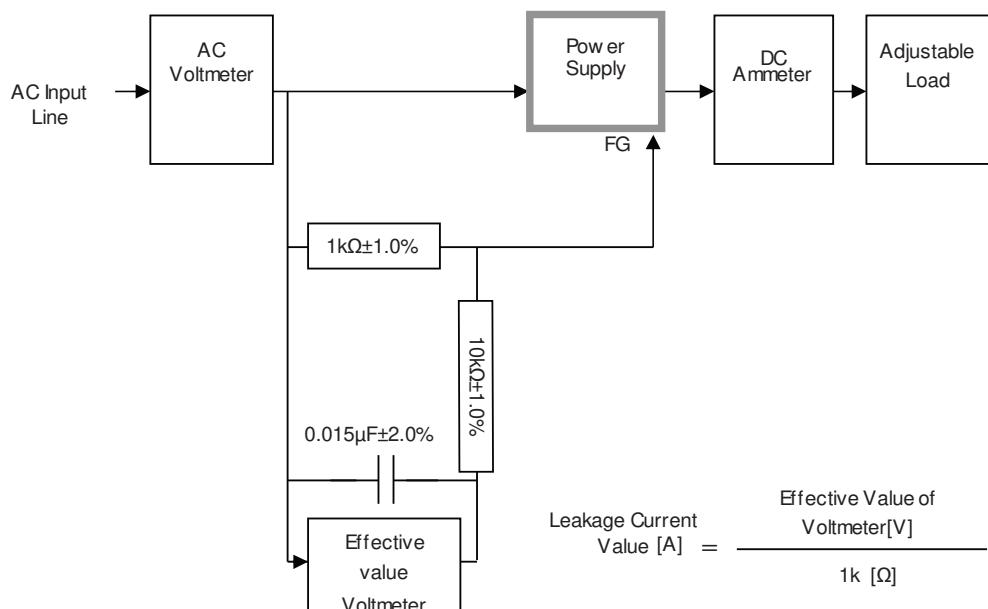


Figure C-1 (IEC60601-1)

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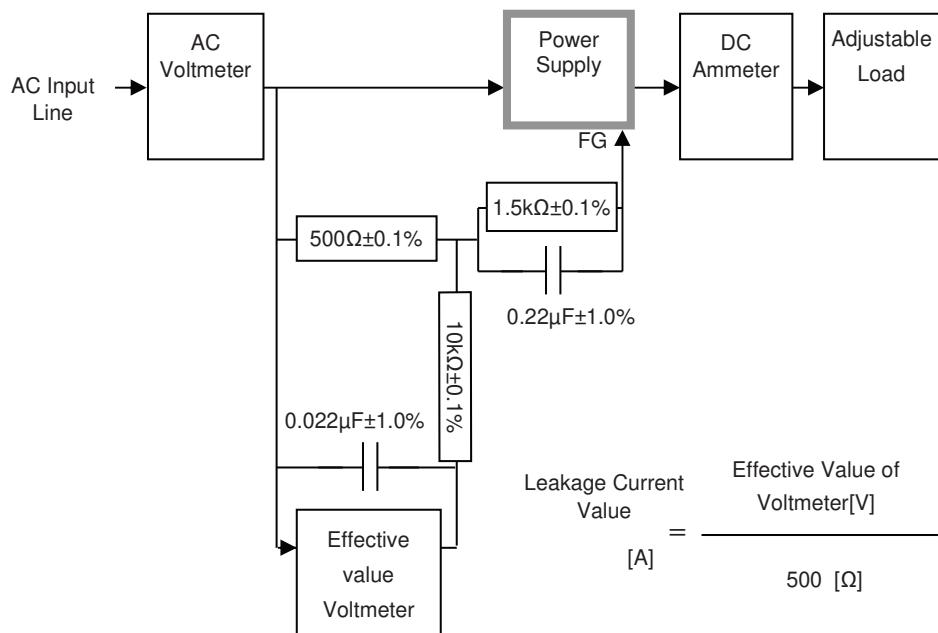


Figure C-2 (IEC62368-1 refer to IEC60990 Fig.4)

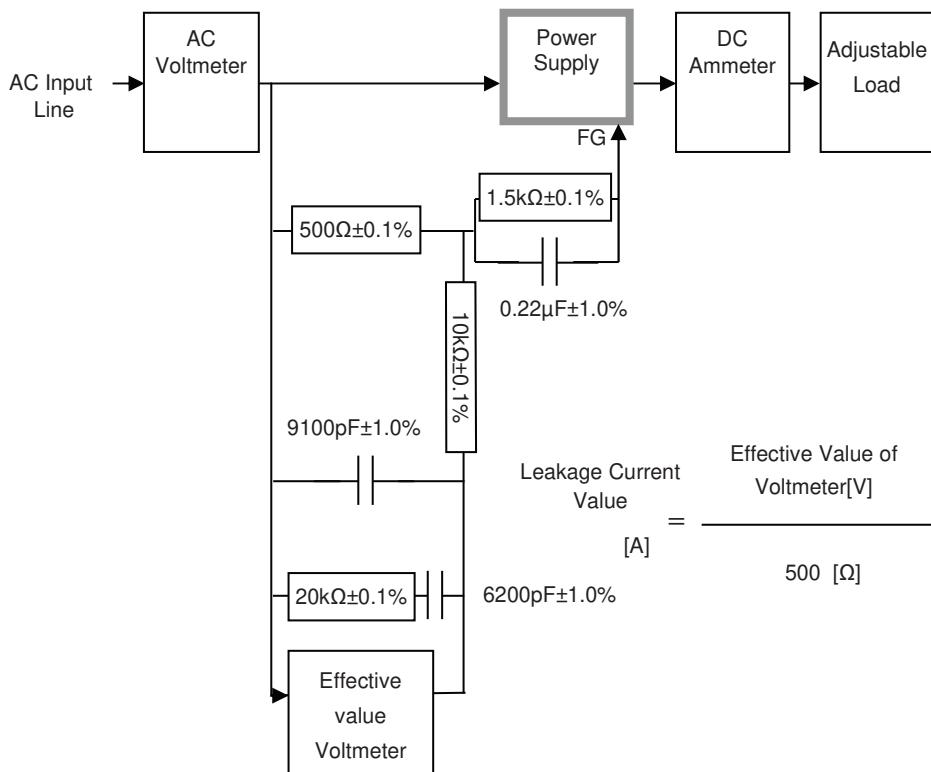


Figure C-3 (IEC62368-1 refer to IEC60990 Fig.5)