



TEST DATA OF UMA60F-24

Regulated DC Power Supply
January 12, 2023

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Design Manager

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Design Engineer

COSEL CO.,LTD.



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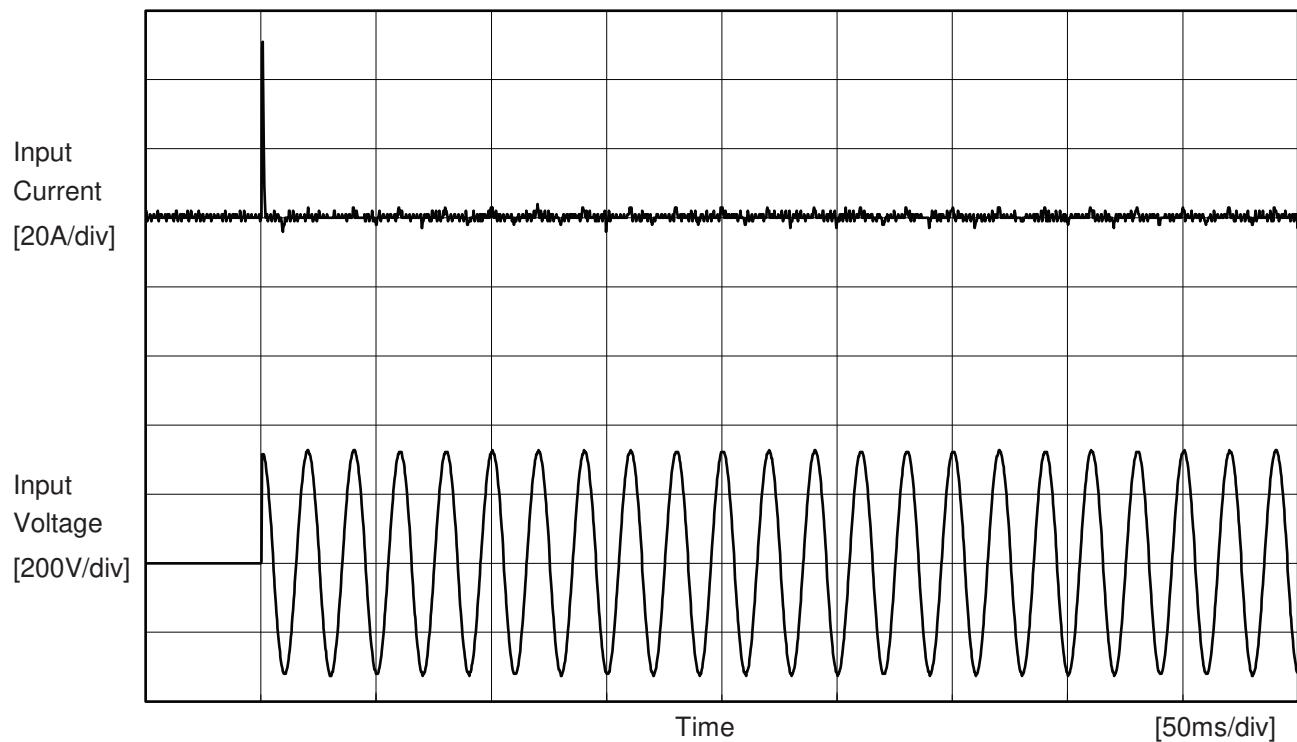
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<p>The graph plots Power Factor (Y-axis, 0 to 0.8) against Load Current [A] (X-axis, 0 to 3). Three curves are shown for Input Voltages: 115V (solid line with triangles), 230V (dashed line with squares), and 264V (dash-dot line with circles). All curves start at (0,0) and increase monotonically. The 115V curve reaches the highest power factor of approximately 0.58 at 2.5A. The 230V curve reaches approximately 0.48 at 2.5A. The 264V curve reaches approximately 0.45 at 2.5A.</p>		<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Power Factor</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>0.0</td><td>0.068</td><td>0.026</td><td>0.024</td></tr> <tr><td>0.5</td><td>0.483</td><td>0.379</td><td>0.372</td></tr> <tr><td>1.0</td><td>0.535</td><td>0.432</td><td>0.422</td></tr> <tr><td>1.5</td><td>0.556</td><td>0.458</td><td>0.444</td></tr> <tr><td>2.0</td><td>0.568</td><td>0.470</td><td>0.455</td></tr> <tr><td>2.5</td><td>0.579</td><td>0.477</td><td>0.461</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> <tr><td>--</td><td>-</td><td>-</td><td>-</td></tr> </tbody> </table>		Load Current [A]	Power Factor			Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]	0.0	0.068	0.026	0.024	0.5	0.483	0.379	0.372	1.0	0.535	0.432	0.422	1.5	0.556	0.458	0.444	2.0	0.568	0.470	0.455	2.5	0.579	0.477	0.461	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
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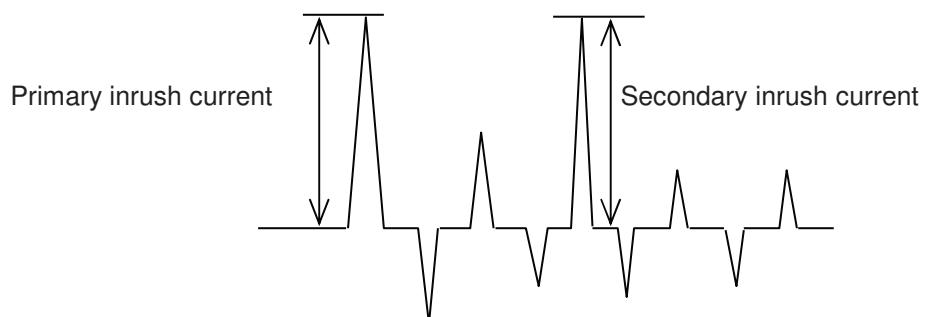
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Model	UMA60F-24	Temperature Testing Circuitry Figure A	25°C
Item	Inrush Current		
Object	+24V2.5A		



Input Voltage	230 V
Frequency	50 Hz
Load	100 %

Primary inrush current	51.0 A
Secondary inrush current	4.0 A





Model	UMA60F-24	Temperature	25°C
Item	Leakage Current	Testing Circuitry	Figure C
Object	+24V2.5A		

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.

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<p>Output Voltage [V]</p> <p>Input Voltage [V]</p> <p>Legend:</p> <ul style="list-style-type: none"> Load 50% (Dashed line with squares) Load 100% (Solid line with triangles) <table border="1"> <thead> <tr> <th>Input Voltage [V]</th> <th>Output Voltage [V] (Load 50%)</th> <th>Output Voltage [V] (Load 100%)</th> </tr> </thead> <tbody> <tr><td>100</td><td>24.175</td><td>24.175</td></tr> <tr><td>132</td><td>24.175</td><td>24.175</td></tr> <tr><td>170</td><td>24.175</td><td>24.175</td></tr> <tr><td>200</td><td>24.175</td><td>24.175</td></tr> <tr><td>230</td><td>24.175</td><td>24.175</td></tr> <tr><td>264</td><td>24.175</td><td>24.175</td></tr> </tbody> </table>				Input Voltage [V]	Output Voltage [V] (Load 50%)	Output Voltage [V] (Load 100%)	100	24.175	24.175	132	24.175	24.175	170	24.175	24.175	200	24.175	24.175	230	24.175	24.175	264	24.175	24.175											
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2.Values	<table border="1"> <thead> <tr> <th rowspan="2">Load Current [A]</th> <th colspan="3">Output Voltage [V]</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>0.0</td><td>24.190</td><td>24.190</td><td>24.190</td></tr> <tr><td>0.5</td><td>24.182</td><td>24.183</td><td>24.183</td></tr> <tr><td>1.0</td><td>24.175</td><td>24.176</td><td>24.176</td></tr> <tr><td>1.5</td><td>24.168</td><td>24.169</td><td>24.169</td></tr> <tr><td>2.0</td><td>24.161</td><td>24.161</td><td>24.161</td></tr> <tr><td>2.5</td><td>24.153</td><td>24.154</td><td>24.154</td></tr> <tr><td>--</td><td>--</td><td>--</td><td>--</td></tr> <tr><td>--</td><td>--</td><td>--</td><td>--</td></tr> <tr><td>--</td><td>--</td><td>--</td><td>--</td></tr> <tr><td>--</td><td>--</td><td>--</td><td>--</td></tr> <tr><td>--</td><td>--</td><td>--</td><td>--</td></tr> </tbody> </table>			Load Current [A]	Output Voltage [V]			Input Volt. 115[V]	Input Volt. 230[V]	Input Volt. 264[V]	0.0	24.190	24.190	24.190	0.5	24.182	24.183	24.183	1.0	24.175	24.176	24.176	1.5	24.168	24.169	24.169	2.0	24.161	24.161	24.161	2.5	24.153	24.154	24.154	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
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Item	Ripple-Noise	Temperature	25°C																																																			
Object	+24V2.5A	Testing Circuitry	Figure B																																																			
1.Graph	<p>Input Voltage 230V Load 100%</p>																																																					

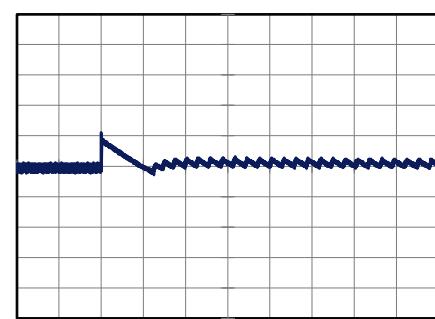
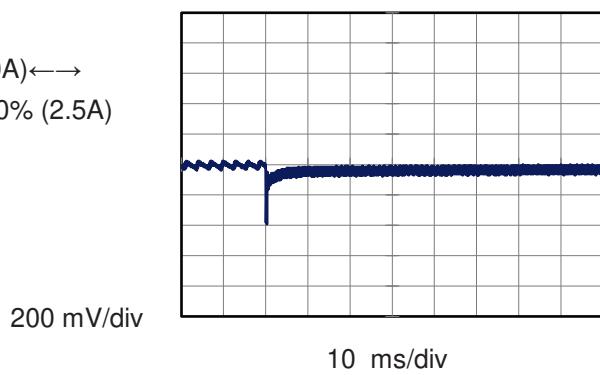
COSEL

Model	UMA60F-24	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+24V2.5A		

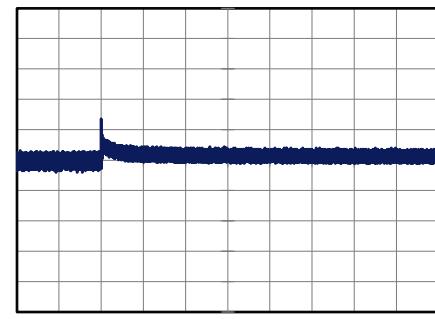
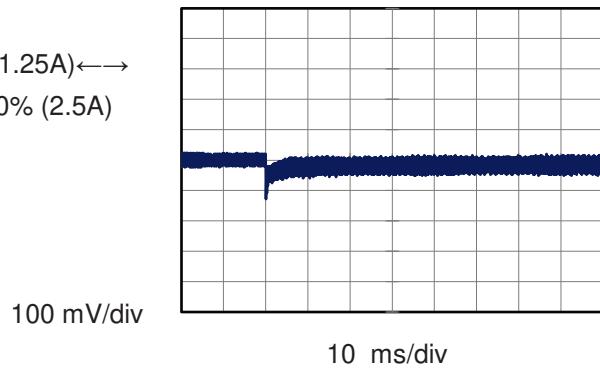
Input Volt. 230 V
 Cycle 1000 ms



Min.Load (0A)↔
 Load 100% (2.5A)



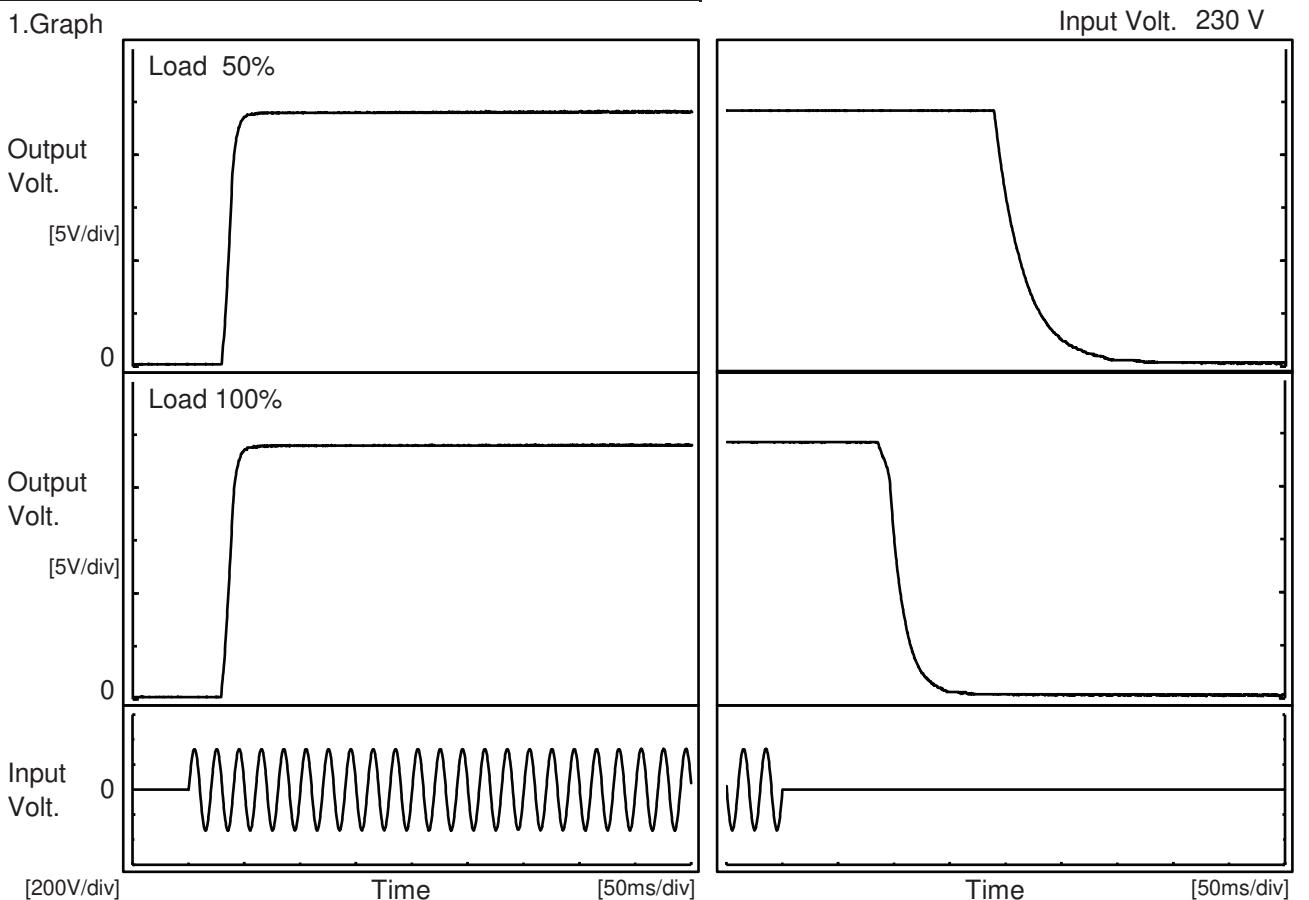
Load 50% (1.25A)↔
 Load 100% (2.5A)



COSEL

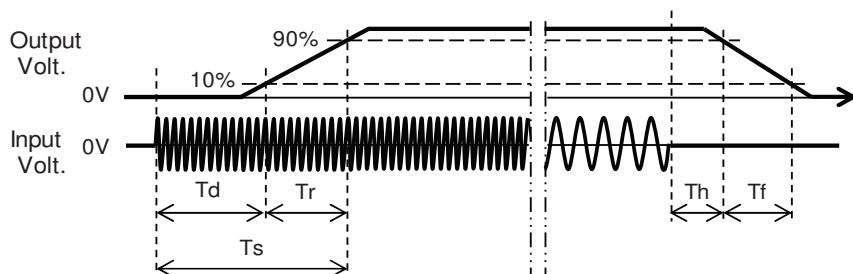
Model	UMA60F-24	Temperature Testing Circuitry Figure A	25°C
Item	Rise and Fall Time		
Object	+24V2.5A		

1. Graph



2. Values

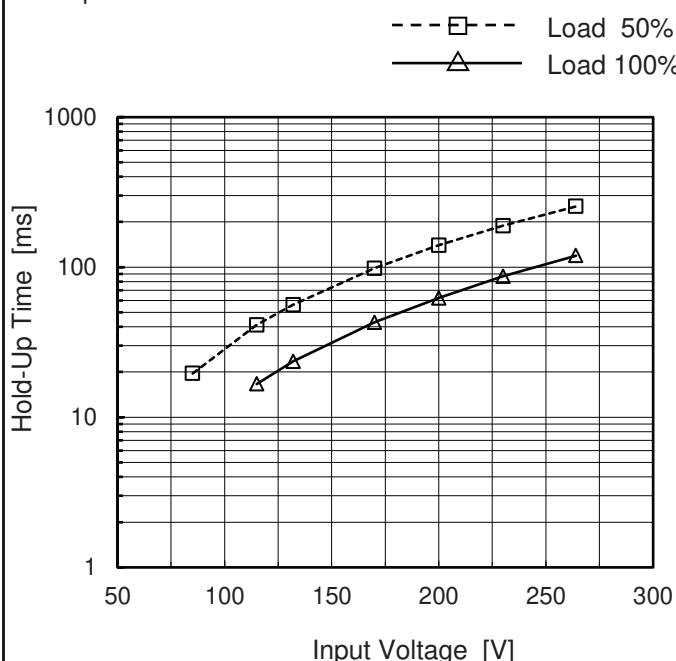
Load	Time	Td	Tr	Ts	Th	Tf	[ms]
50 %		31.8	11.8	43.6	191.8	56.5	
100 %		31.5	12.0	43.5	93.3	30.3	



COSEL

Model	UMA60F-24	Temperature	25°C
Item	Hold-Up Time	Testing Circuitry	Figure A
Object	+24V2.5A		

1.Graph



2.Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
85	20	-
100	30	-
115	41	17
132	56	24
170	98	43
200	140	62
230	189	87
264	254	119
--	-	-

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-24	Temperature	25°C																																																			
Item	Instantaneous Interruption Compensation	Testing Circuitry	Figure A																																																			
Object	+24V2.5A																																																					
1.Graph	<p>Legend:</p> <ul style="list-style-type: none"> Input Volt. 115V (solid line with open triangle) Input Volt. 230V (dashed line with open square) Input Volt. 264V (dash-dot line with open circle) <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>115[V] [ms]</th> <th>230[V] [ms]</th> <th>264[V] [ms]</th> </tr> </thead> <tbody> <tr><td>0.5</td><td>109</td><td>750</td><td>895</td></tr> <tr><td>1.0</td><td>53</td><td>241</td><td>323</td></tr> <tr><td>1.5</td><td>34</td><td>159</td><td>214</td></tr> <tr><td>2.0</td><td>24</td><td>117</td><td>158</td></tr> <tr><td>2.5</td><td>16</td><td>87</td><td>119</td></tr> </tbody> </table>			Load Current [A]	115[V] [ms]	230[V] [ms]	264[V] [ms]	0.5	109	750	895	1.0	53	241	323	1.5	34	159	214	2.0	24	117	158	2.5	16	87	119																											
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COSEL

Model	UMA60F-24	Temperature	25°C																																																																																							
Item	Overcurrent Protection	Testing Circuitry	Figure A																																																																																							
Object	+24V2.5A																																																																																									
1.Graph		2.Values																																																																																								
<p>The graph plots Output Voltage [V] on the y-axis (8 to 32) against Load Current [A] on the x-axis (0 to 4). Three curves are shown for Input Volt. 115V (black), Input Volt. 230V (blue), and Input Volt. 264V (orange). All curves show a constant output voltage of 24V up to a load current of about 2.5A, after which the voltage drops rapidly. A slanted line highlights the range from approximately 2.2A to 2.8A, indicating the rated load current range.</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>24</td><td>3.39</td><td>3.24</td><td>3.37</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]	24	3.39	3.24	3.37	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Output Voltage [V]	Load Current [A]																																																																																									
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Note: Slanted line shows the range of the rated load current.

Overcurrent protection is Hiccup mode.



Model	UMA60F-24	
Item	Ambient Temperature Drift	Testing Circuitry Figure A
Object	+24V2.5A	

1.Values

Load 100%

Ambient Temperature[°C]	Output Voltage [V]		
	Input Volt. 115V	Input Volt. 230V	Input Volt. 264V
-20	24.081	24.084	24.085
25	24.154	24.155	24.155
50	24.170	24.171	24.171

Item	Minimum Input Voltage for Regulated Output Voltage	Testing Circuitry Figure A
Object	+24V2.5A	

1.Values

Ambient Temperature[°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	36	65
25	37	65
50	34	66

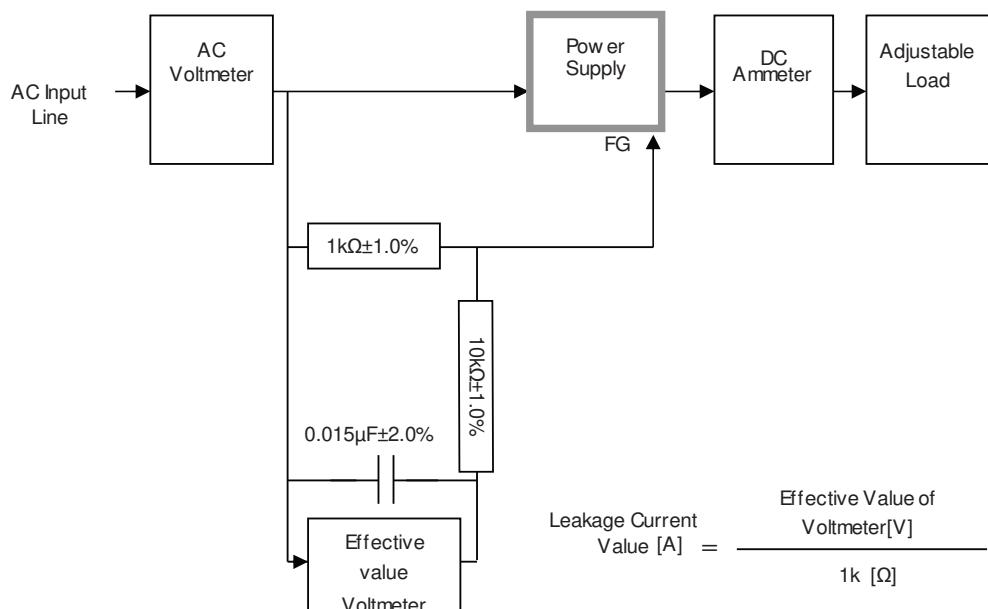
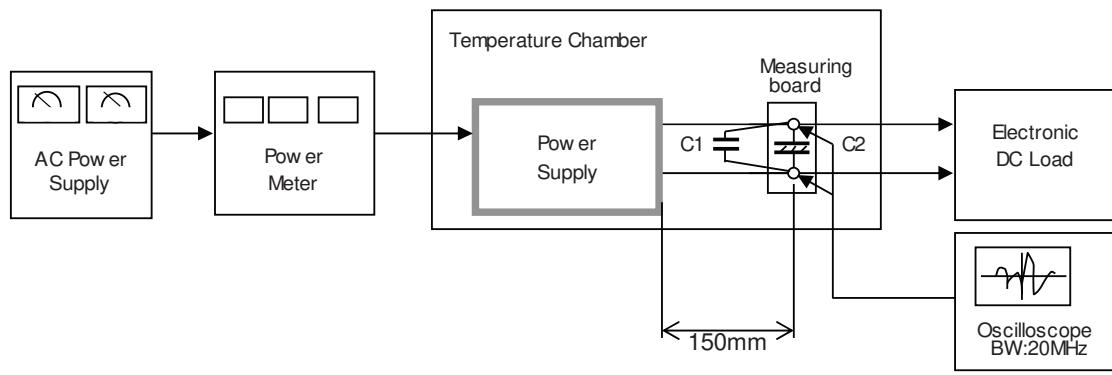
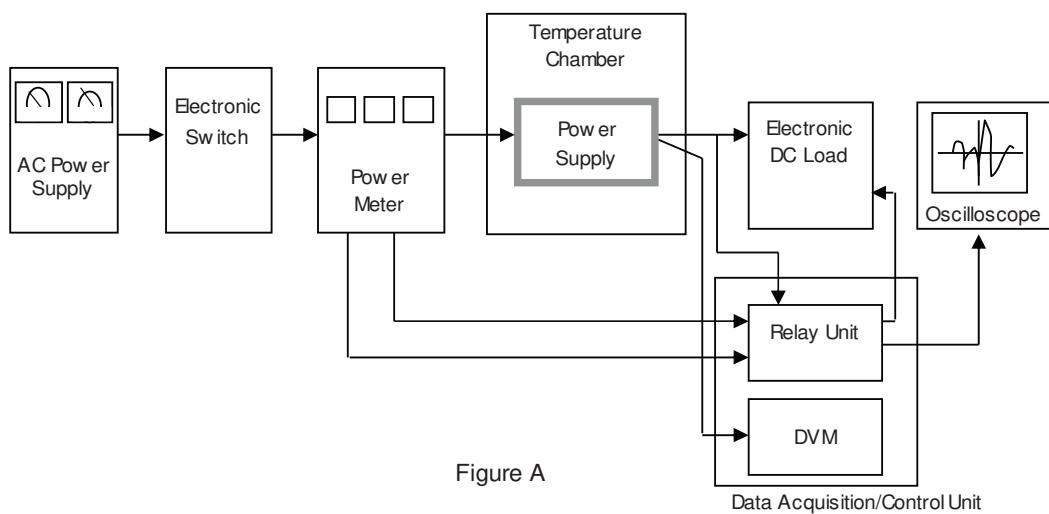
Item	Overvoltage Protection	Testing Circuitry Figure A
Object	+24V2.5A	

1.Values

Load 0%

Ambient Temperature[°C]	Operating Point [V]	
	Input Volt. 115V	Input Volt. 264V
-20	30.15	30.15
25	31.42	31.42
50	32.09	32.17

COSEL



COSEL

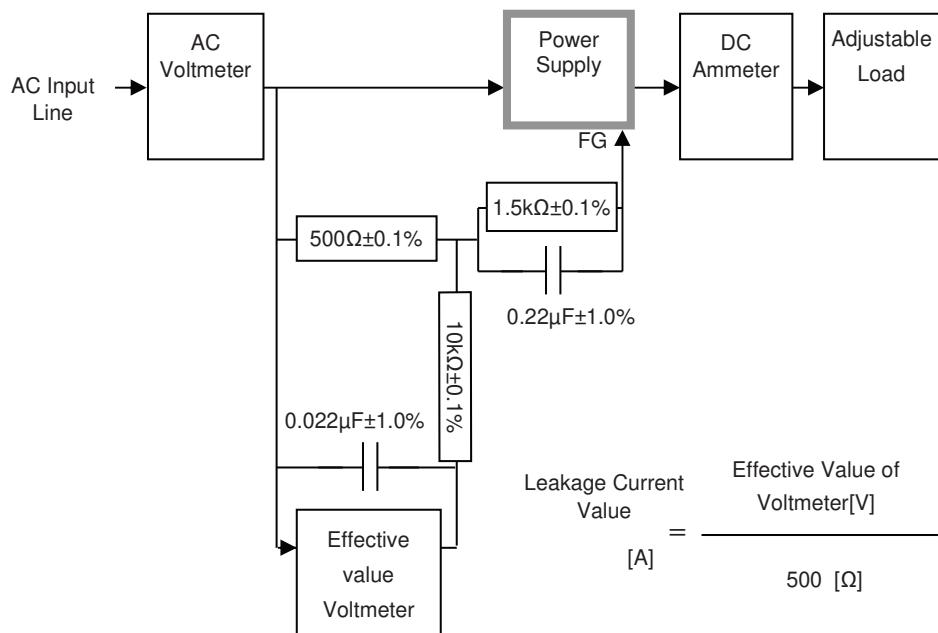


Figure C-2 (IEC62368-1 refer to IEC60990 Fig.4)

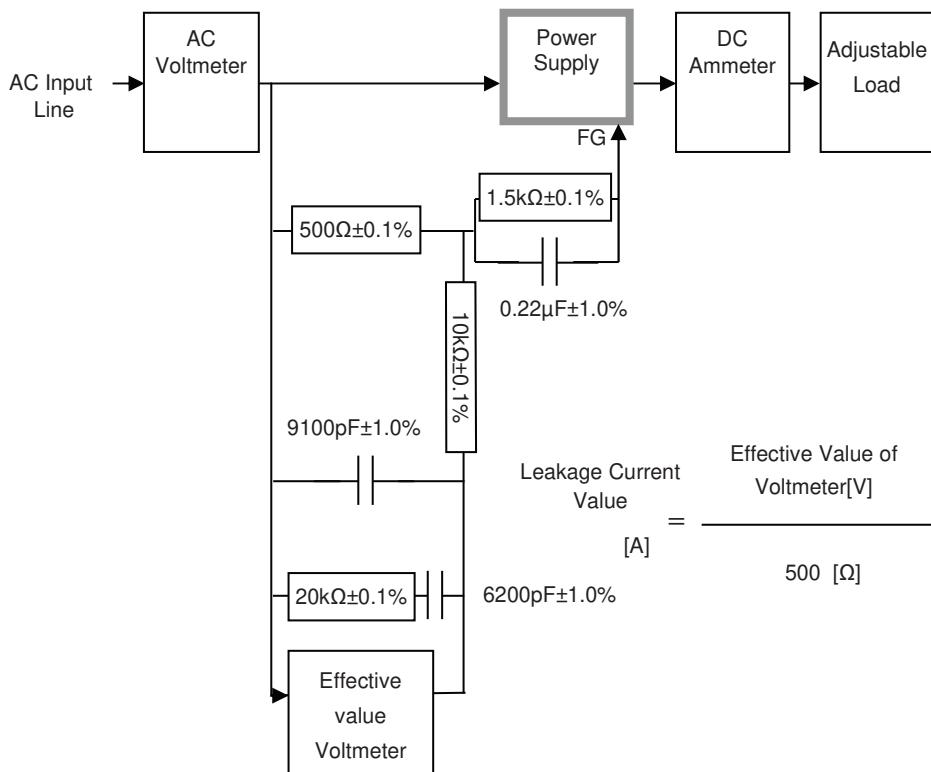


Figure C-3 (IEC62368-1 refer to IEC60990 Fig.5)