

TEST DATA OF LHA75F-15

Regulated DC Power Supply
September 10, 2019

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Junya Kaneda Design Manager

Prepared by : Shuto Takai
Shuto Takai Design Engineer

COSEL CO.,LTD.

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Model		LHA75F-15		Temperature 25°C																																																		
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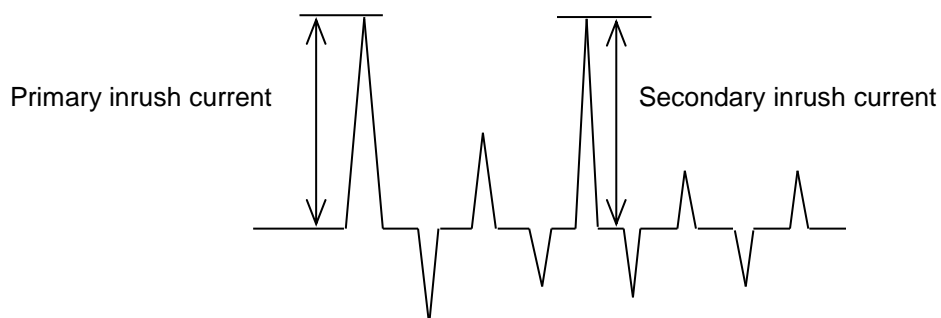
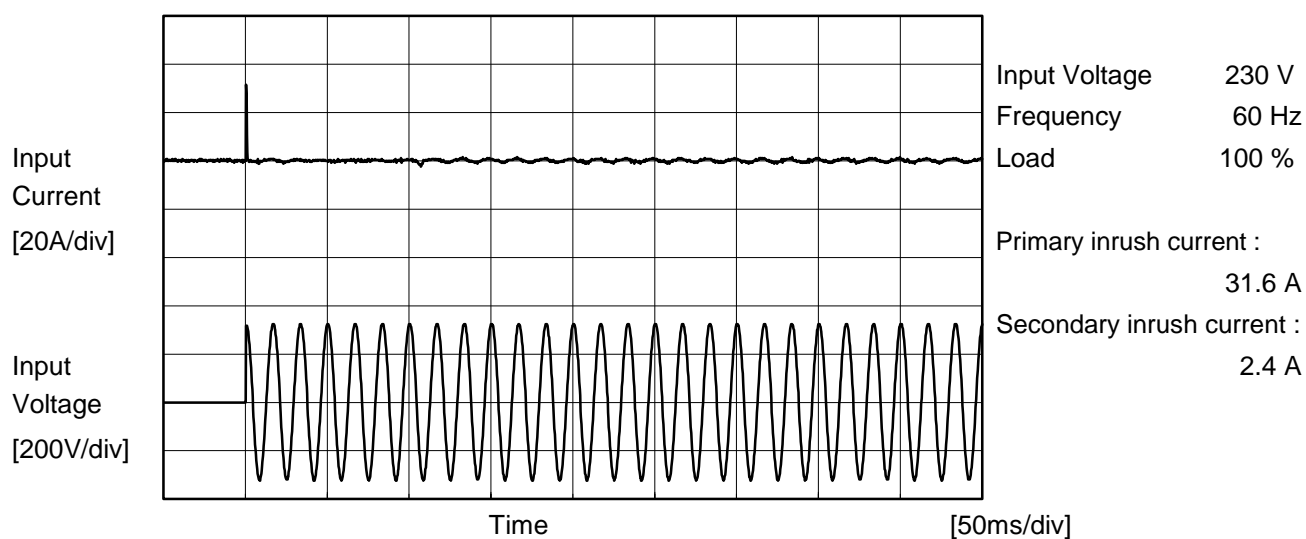
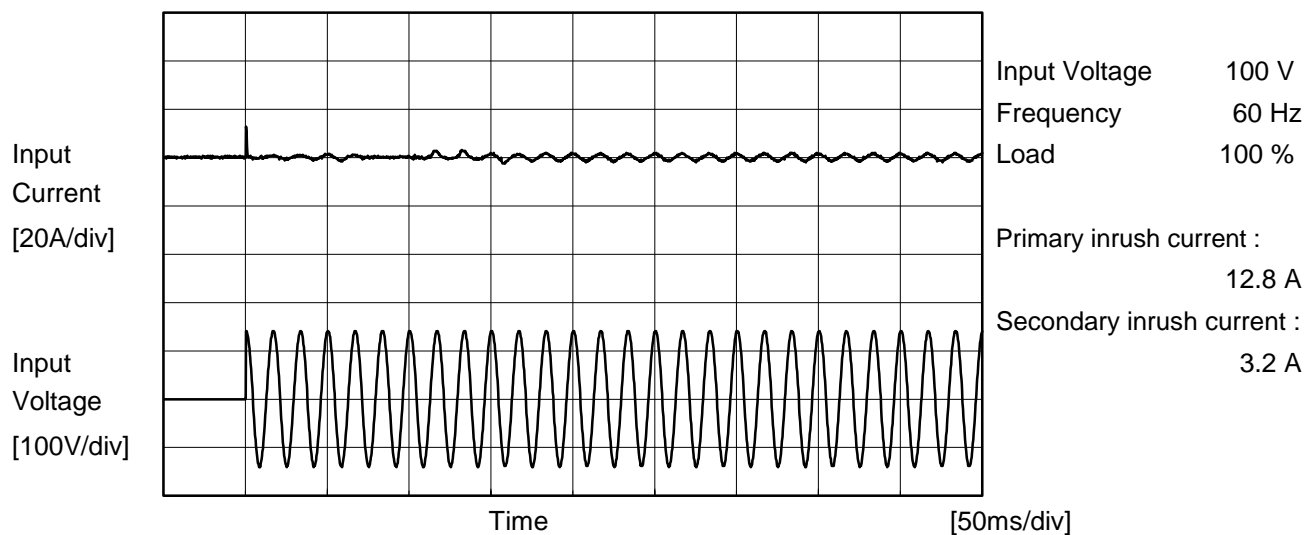
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Model	LHA75F-15	Temperature 25°C Testing Circuitry Figure A	
Item	Inrush Current		
Object	_____		





Model		LHA75F-15	Temperature 25°C Testing Circuitry Figure B
Item		Leakage Current	
Object		_____	

1.Results

[mA]

Standards	Testing Circuitry	Measuring Method	Input Volt.			Note
			100 [V]	230 [V]	240 [V]	
DEN-AN	Figure B-1	Both phases	0.13	0.34	0.36	Operation
		One of phases	0.26	0.67	0.71	Stand by
IEC62368-1	Figure B-2	Both phases	0.11	0.28	0.29	Operation
		One of phases	0.21	0.56	0.58	Stand by
	Figure B-3	Both phases	0.11	0.28	0.30	Operation
		One of phases	0.21	0.55	0.58	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.



Model	LHA75F-15																																		
Item	Line Regulation	Temperature	25°C																																
Object	+15V5A	Testing Circuitry	Figure A																																
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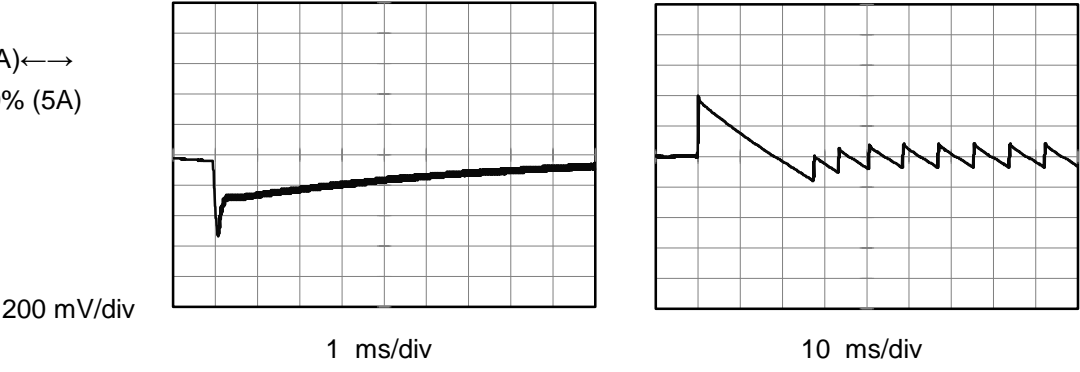


Model	LHA75F-15		
Item	Dynamic Load Response	Temperature	25°C
Object	+15V5A	Testing Circuitry	Figure A

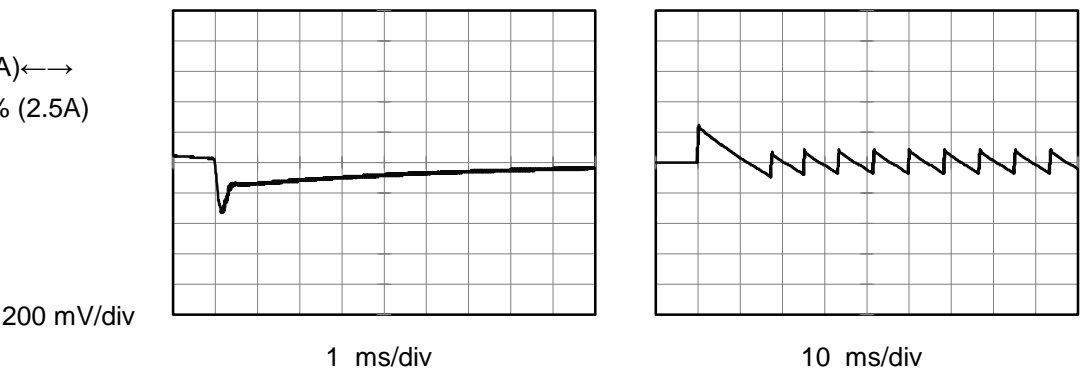
Input Volt. 230 V
Cycle 1000 ms



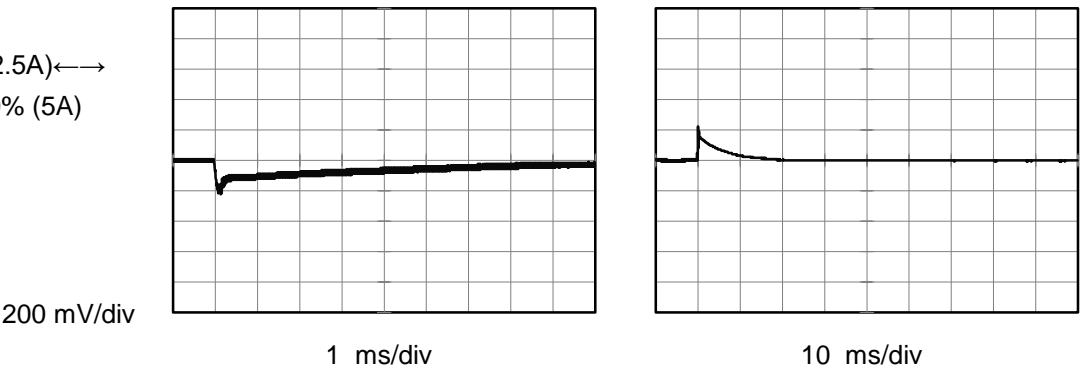
Min.Load (0A) ←→
Load 100% (5A)



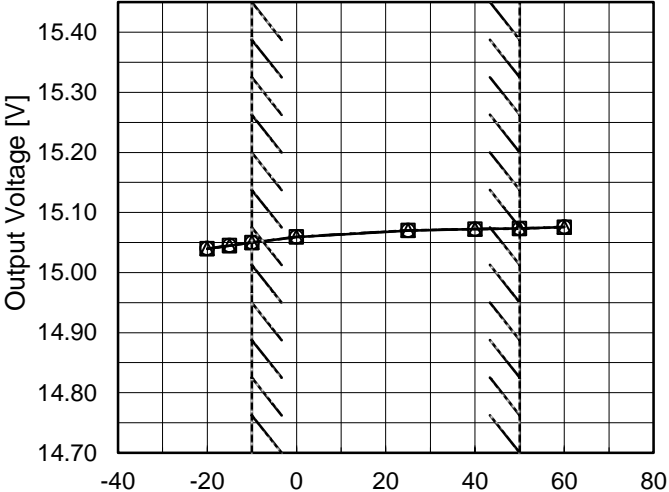
Min.Load (0A) ←→
Load 50% (2.5A)



Load 50% (2.5A) ←→
Load 100% (5A)



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0.0	185	185																																							
1.0	30	30																																							
2.0	40	40																																							
3.0	50	50																																							
4.0	60	60																																							
5.0	65	65																																							
5.5	70	70																																							
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<div><div><div><div></div><div></div></div><div><div></div><div></div></div></div><div>T1: Due to AC Input Line</div><div>T2: Due to Switching</div></div> <div><p>Ripple-Noise [mVp-p]</p><p>T1</p><p>T2</p></div> <div>Fig. Complex Ripple Wave Form</div>																																									

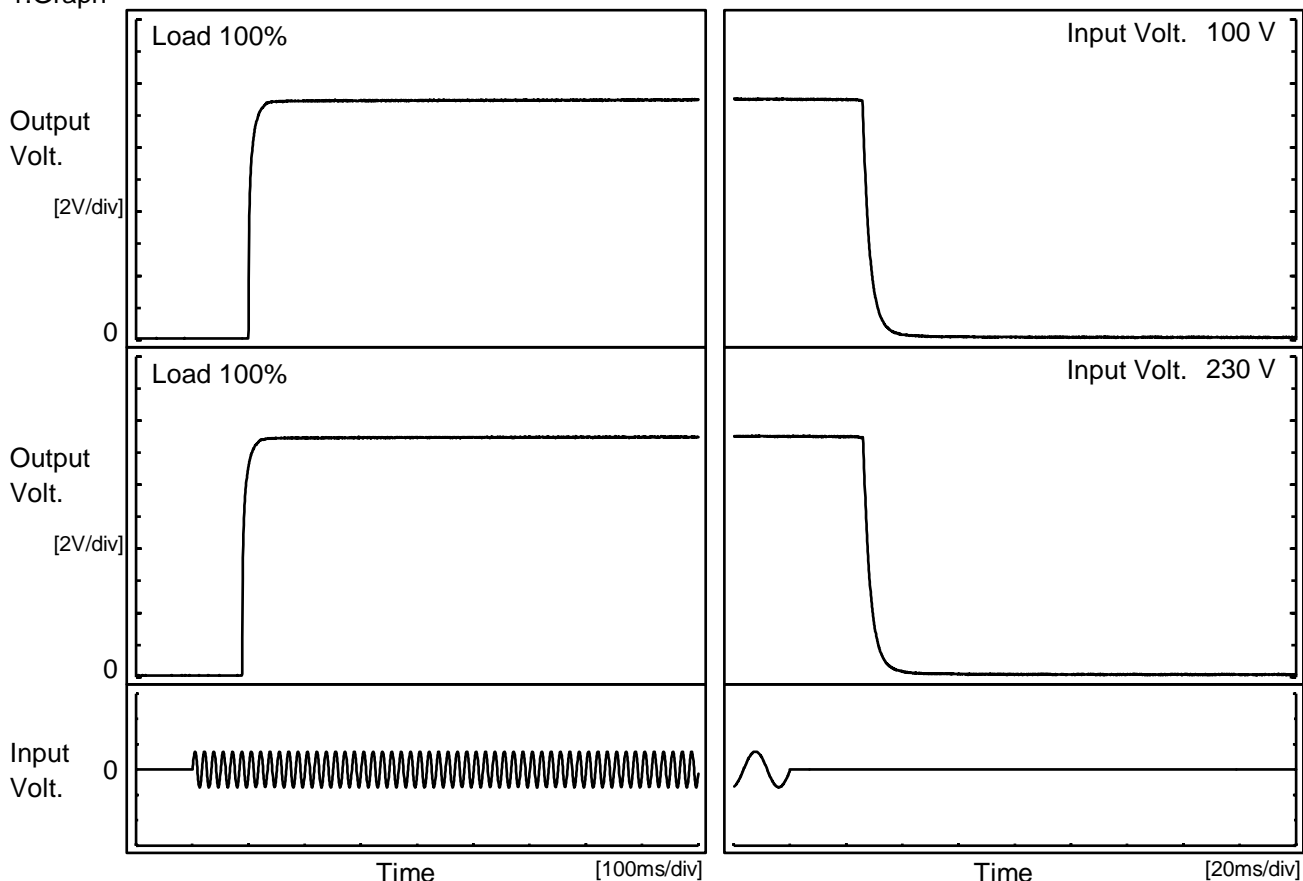
Model		LHA75F-15	Testing Circuitry Figure A																																																		
Item		Ambient Temperature Drift																																																			
Object		+15V5A																																																			
1.Graph																																																					
		<div><div><div>—△—</div><div>Input Volt.</div><div>100V</div></div><div><div>---□---</div><div>Input Volt.</div><div>200V</div></div><div><div>---○---</div><div>Input Volt.</div><div>230V</div></div></div>	2.Values																																																		
 <p>Output Voltage [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 100%</p>		<table><tr><th rowspan="2">Ambient Temperature [°C]</th><th colspan="3">Output Voltage [V]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>-20</td><td>15.040</td><td>15.040</td><td>15.040</td></tr><tr><td>-15</td><td>15.045</td><td>15.045</td><td>15.045</td></tr><tr><td>-10</td><td>15.050</td><td>15.050</td><td>15.050</td></tr><tr><td>0</td><td>15.059</td><td>15.059</td><td>15.059</td></tr><tr><td>25</td><td>15.070</td><td>15.070</td><td>15.070</td></tr><tr><td>40</td><td>15.072</td><td>15.072</td><td>15.072</td></tr><tr><td>50</td><td>15.073</td><td>15.073</td><td>15.073</td></tr><tr><td>60</td><td>15.076</td><td>15.076</td><td>15.076</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></table>	Ambient Temperature [°C]	Output Voltage [V]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	-20	15.040	15.040	15.040	-15	15.045	15.045	15.045	-10	15.050	15.050	15.050	0	15.059	15.059	15.059	25	15.070	15.070	15.070	40	15.072	15.072	15.072	50	15.073	15.073	15.073	60	15.076	15.076	15.076	--	-	-	-	--	-	-	-	--	-	-	-
Ambient Temperature [°C]	Output Voltage [V]																																																				
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																		
-20	15.040	15.040	15.040																																																		
-15	15.045	15.045	15.045																																																		
-10	15.050	15.050	15.050																																																		
0	15.059	15.059	15.059																																																		
25	15.070	15.070	15.070																																																		
40	15.072	15.072	15.072																																																		
50	15.073	15.073	15.073																																																		
60	15.076	15.076	15.076																																																		
--	-	-	-																																																		
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Note: Slanted line shows the range of the rated ambient temperature.																																																					

- 10 -

BC-11409

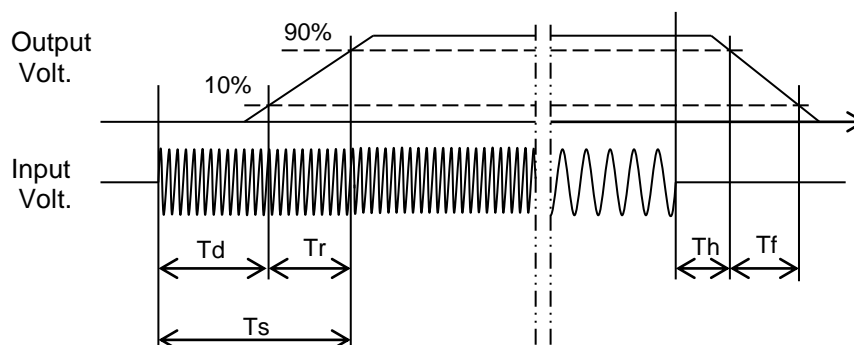
Model	LHA75F-15		
Item	Rise and Fall Time	Temperature	25°C
Object	+15V5A	Testing Circuitry	Figure A

1.Graph



2.Values

		[ms]				
Input Volt.	Time	Td	Tr	Ts	Th	Tf
100 V		100.5	13.5	114.0	26.0	5.9
230 V		89.0	14.0	103.0	26.2	5.9



Model	LHA75F-15																																		
Item	Hold-Up Time	Temperature	25°C																																
Object	+15V5A	Testing Circuitry	Figure A																																
1.Graph		2.Values																																	
<div><div><div>---</div><div>□</div><div>---</div><div>Load 50%</div></div><div><div>—</div><div>△</div><div>—</div><div>Load 100%</div></div></div> <p>Hold-Up Time [ms]</p> <p>Input Voltage [V]</p> <p>This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy. Note: Slanted line shows the range of the rated input voltage.</p>		<table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Hold-Up Time [ms]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>85</td><td>52</td><td>-</td></tr><tr><td>90</td><td>52</td><td>26</td></tr><tr><td>100</td><td>52</td><td>26</td></tr><tr><td>120</td><td>52</td><td>26</td></tr><tr><td>200</td><td>52</td><td>26</td></tr><tr><td>230</td><td>52</td><td>26</td></tr><tr><td>264</td><td>52</td><td>26</td></tr><tr><td>280</td><td>55</td><td>28</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Hold-Up Time [ms]		Load 50%	Load 100%	85	52	-	90	52	26	100	52	26	120	52	26	200	52	26	230	52	26	264	52	26	280	55	28	--	-	-
Input Voltage [V]	Hold-Up Time [ms]																																		
	Load 50%	Load 100%																																	
85	52	-																																	
90	52	26																																	
100	52	26																																	
120	52	26																																	
200	52	26																																	
230	52	26																																	
264	52	26																																	
280	55	28																																	
--	-	-																																	

Model		LHA75F-15	Temperature 25°C Testing Circuitry Figure A																																																			
Item		Instantaneous Interruption Compensation																																																				
Object		+15V5A																																																				
1.Graph		<div><div>—△—</div>Input Volt. 100V</div> <div><div>---□---</div>Input Volt. 200V</div> <div><div>-·-○-·-</div>Input Volt. 230V</div> <p>Instantaneous Compensation Time [ms]</p> <p>Load Current [A]</p>	2.Values																																																			
		<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Time [ms]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 200[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>1.0</td><td>119</td><td>122</td><td>128</td></tr><tr><td>2.0</td><td>33</td><td>63</td><td>64</td></tr><tr><td>3.0</td><td>33</td><td>42</td><td>43</td></tr><tr><td>4.0</td><td>31</td><td>32</td><td>32</td></tr><tr><td>5.0</td><td>25</td><td>25</td><td>25</td></tr><tr><td>5.5</td><td>22</td><td>22</td><td>22</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></table>		Load Current [A]	Time [ms]			Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]	0.0	-	-	-	1.0	119	122	128	2.0	33	63	64	3.0	33	42	43	4.0	31	32	32	5.0	25	25	25	5.5	22	22	22	--	-	-	-	--	-	-	-	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																					
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																			
0.0	-	-	-																																																			
1.0	119	122	128																																																			
2.0	33	63	64																																																			
3.0	33	42	43																																																			
4.0	31	32	32																																																			
5.0	25	25	25																																																			
5.5	22	22	22																																																			
--	-	-	-																																																			
--	-	-	-																																																			
--	-	-	-																																																			
--	-	-	-																																																			
Note: Slanted line shows the range of the rated load current.																																																						

Model		LHA75F-15
Item		Minimum Input Voltage for Regulated Output Voltage
Object		+15V5A

1.Graph



Model		LHA75F-15	
Item		Overcurrent Protection	
Object		+15V5A	

1.Graph

Input Volt. 100V

Input Volt. 230V

Output Voltage [V]

20

16

12

8

4

0

0

2

4

6

8

Load Current [A]

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. 100[V]	Input Volt. 230[V]
15.00	6.24	6.24
14.25	-	-
13.50	-	-
12.00	-	-
10.50	-	-
9.00	-	-
7.50	-	-
6.00	-	-
4.50	-	-
3.00	-	-
1.50	-	-
0.00	-	-

Model		LHA75F-15
Item		Overvoltage Protection
Object		+15V5A

1.Graph

△

Input Volt. 100V

□

Input Volt. 230V

Operating Point [V]

</

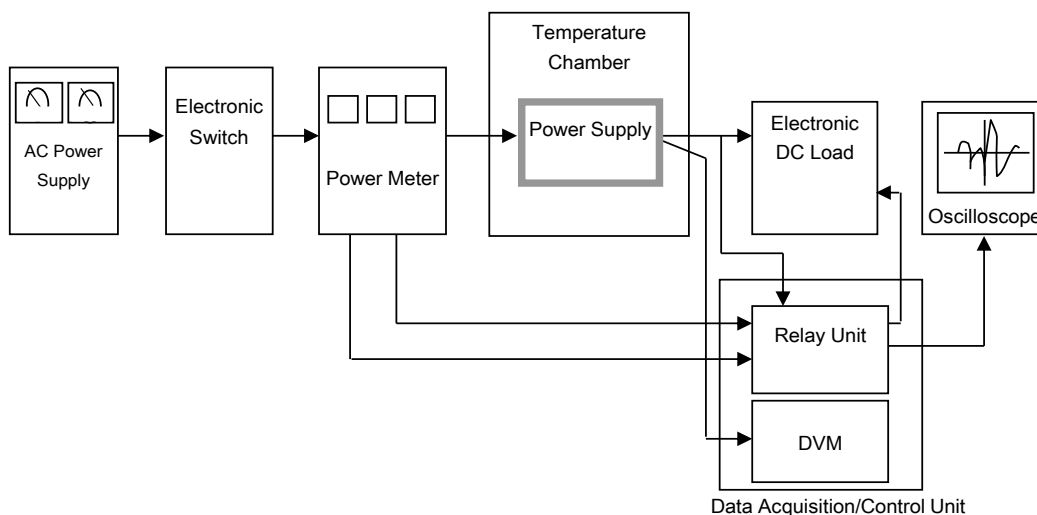


Figure A

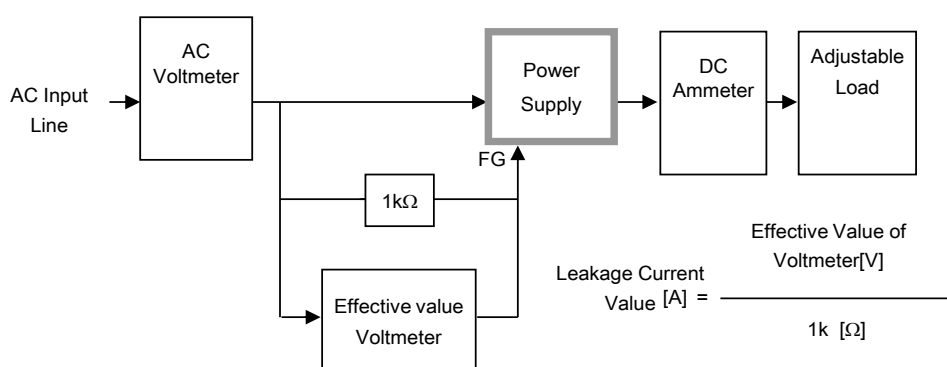


Figure B-1 (DEN-AN)

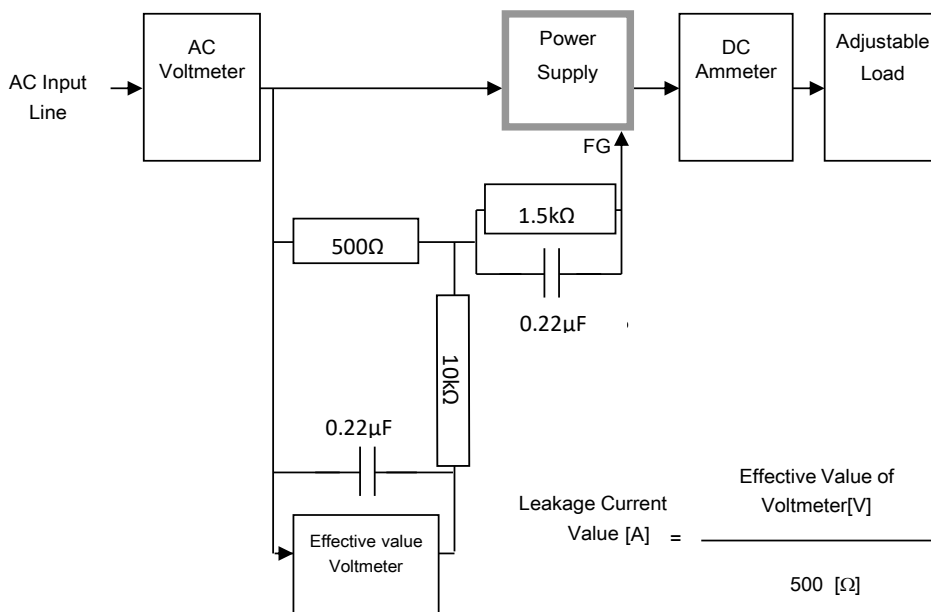


Figure B-2 (IEC62368-1 refer to IEC60990 Fig.4)

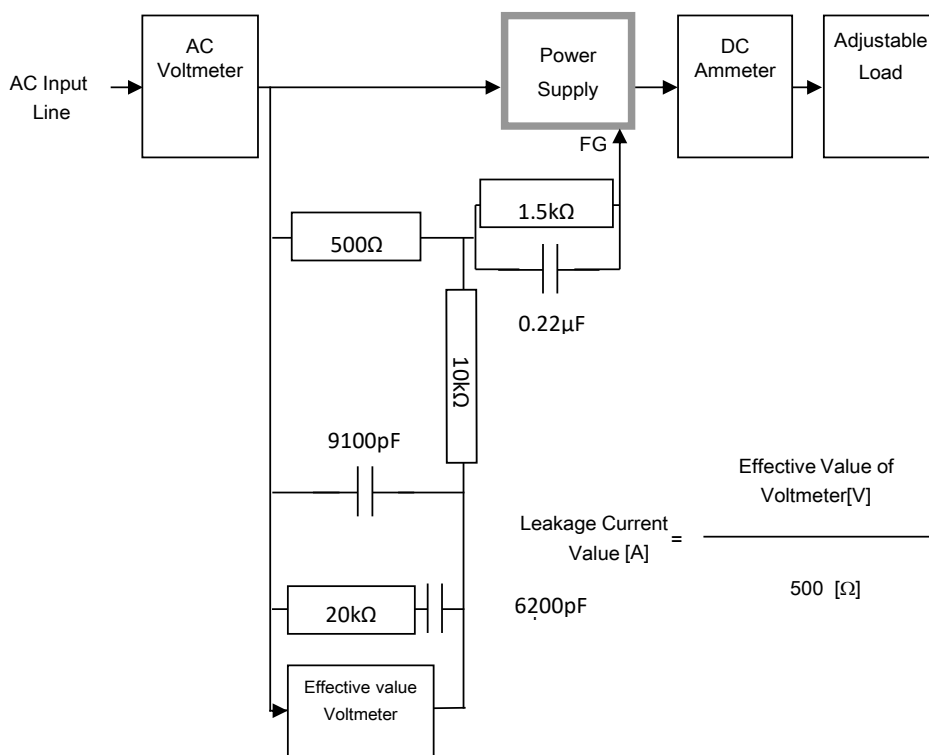


Figure B-3 (IEC62368-1 refer to IEC60990 Fig.5)

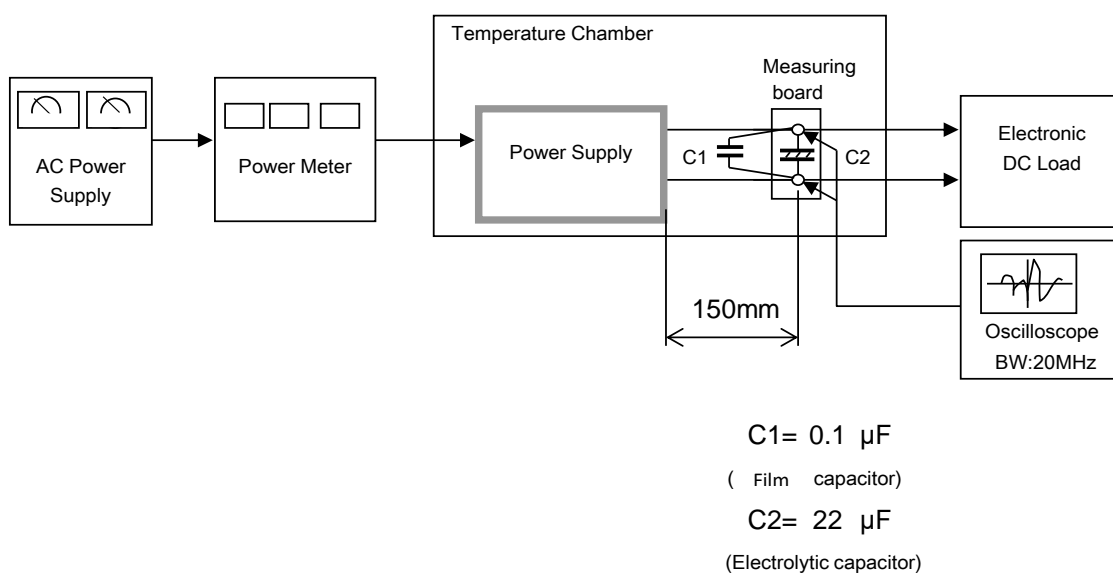


Figure C