

# TEST DATA OF PCA1000F-15

Regulated DC Power Supply  
February 20, 2019

Approved by : Koji Todo  
Koji Todo Design Manager

Prepared by : Terumasa Araki  
Terumasa Araki Design Engineer

**COSEL CO.,LTD.**

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Model		PCA1000F-15		Temperature		25°C																																																				
Item		Input Current (by Load Current)		Testing Circuitry		Figure A																																																				
Object																																																										
1.Graph				2.Values																																																						
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Note: Slanted line shows the range of the rated load current.																																																										

# COSEL

Model

PCA1000F-15

Item

Power Factor (by Load Current)

Object

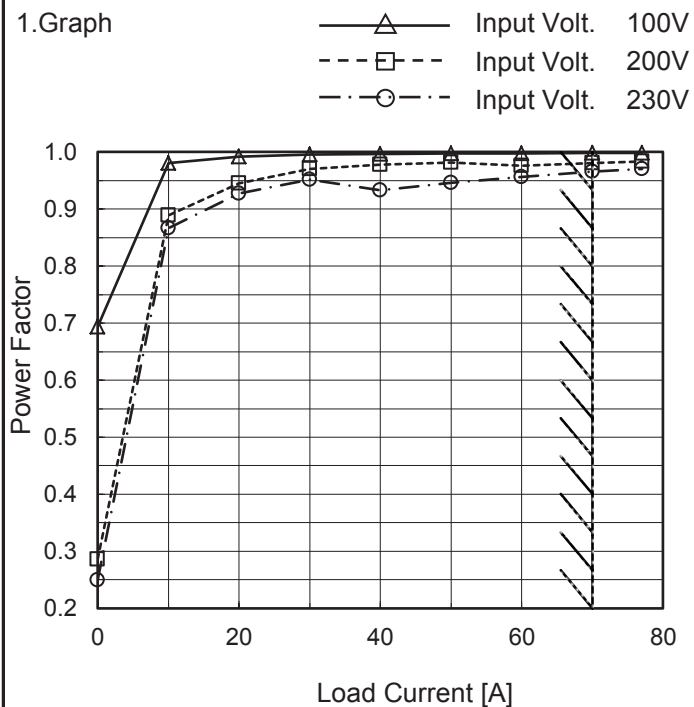
Temperature

25°C

Testing Circuitry

Figure A

## 1.Graph



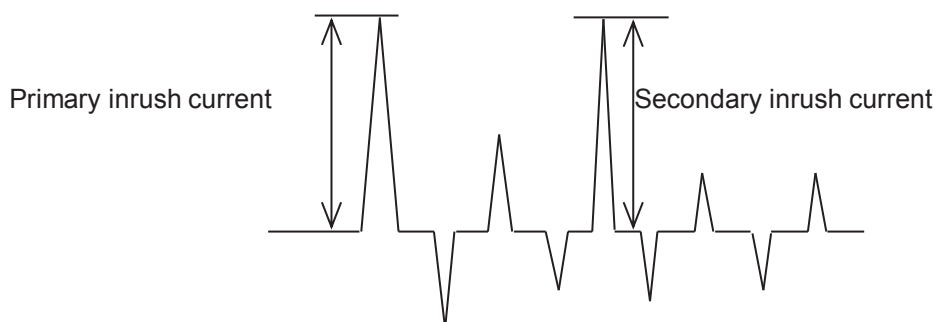
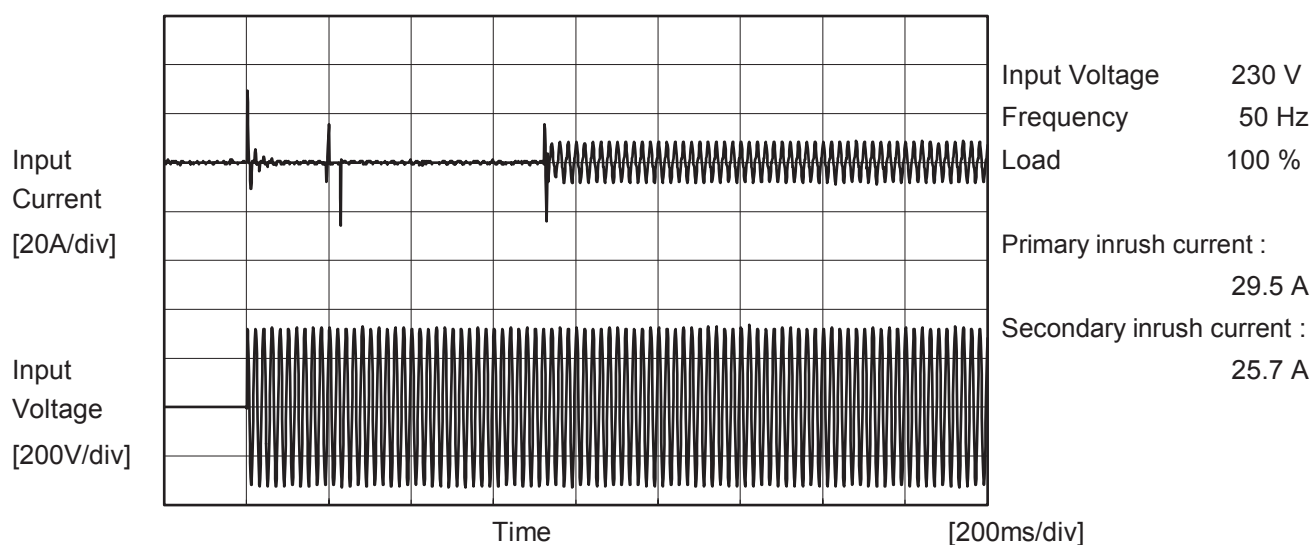
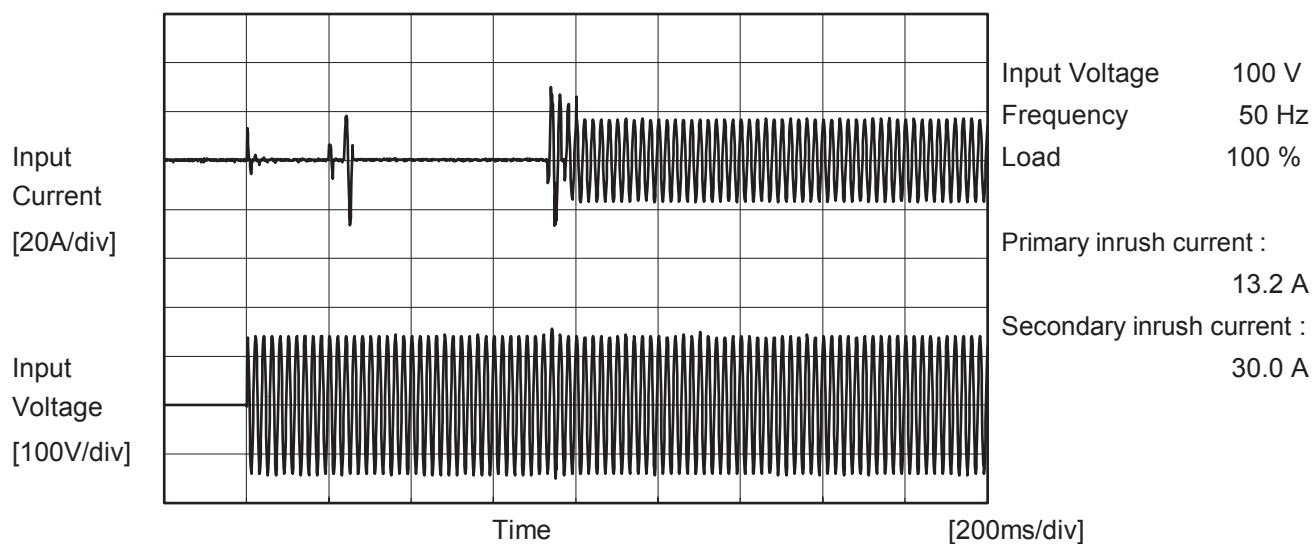
Note: Slanted line shows the range of the rated load current.

## 2.Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]
0.0	0.694	0.286	0.250
10.0	0.981	0.889	0.867
20.0	0.992	0.945	0.928
30.0	0.996	0.971	0.952
40.0	0.997	0.978	0.934
50.0	0.998	0.982	0.946
60.0	0.998	0.976	0.956
70.0	0.998	0.981	0.966
77.0	0.998	0.984	0.971
--	-	-	-
--	-	-	-

# COSEL

Model	PCA1000F-15	Temperature     25°C Testing Circuitry   Figure A	
Item	Inrush Current		
Object	_____		





		Temperature 25°C Testing Circuitry Figure B
Model	PCA1000F-15	
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	0.11	0.29	0.31	Operation
		One of phases	0.22	0.56	0.59	Stand by
IEC62368-1	Figure B-2	Both phases	0.10	0.28	0.30	Operation
		One of phases	0.22	0.56	0.60	Stand by
	Figure B-3	Both phases	0.11	0.29	0.31	Operation
		One of phases	0.22	0.57	0.61	Stand by
IEC60601-1	Figure B-4	Both phases	0.11	0.28	0.29	Operation
		One of phases	0.22	0.55	0.57	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.



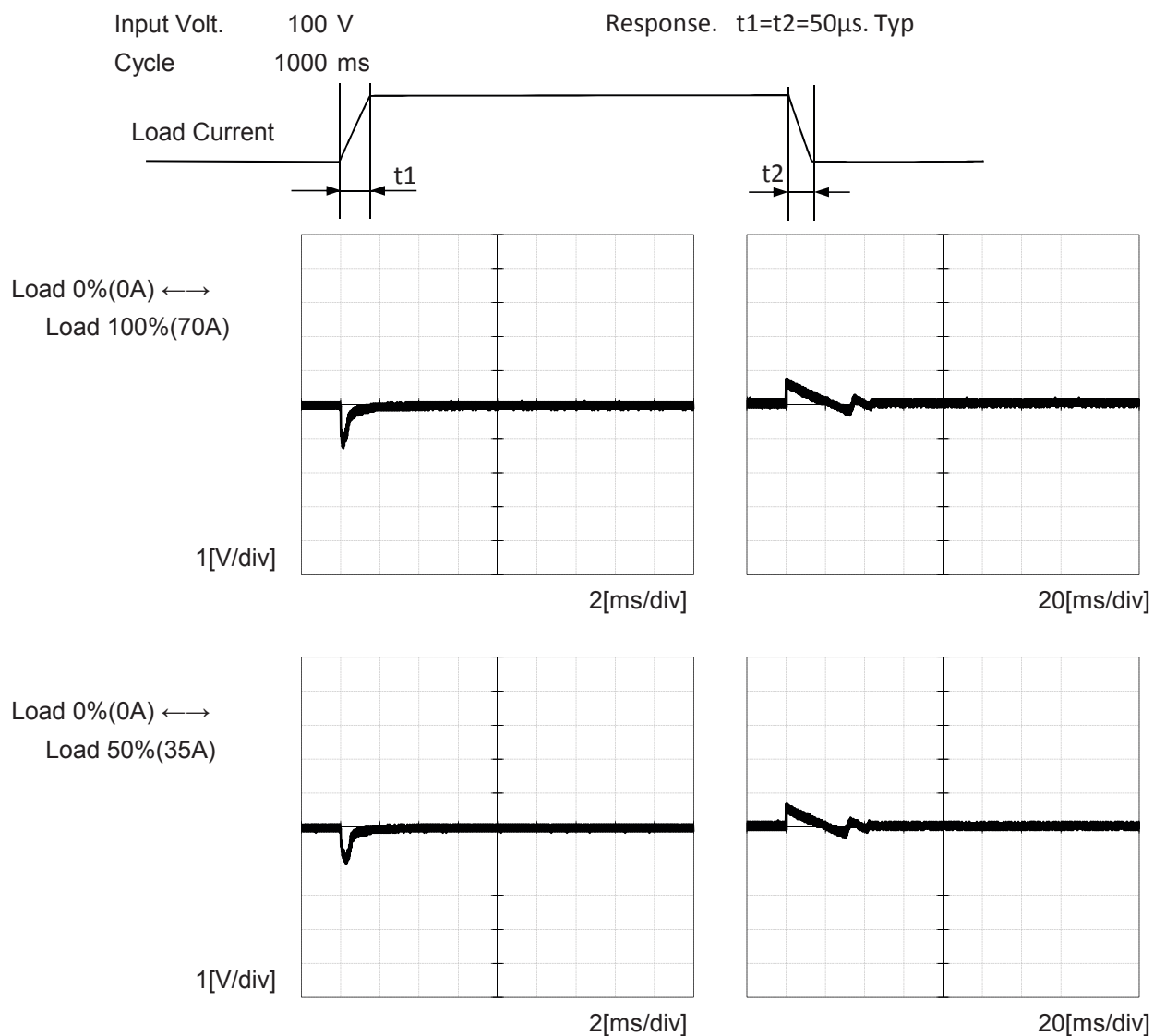
Model	PCA1000F-15																																		
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Object	+15V70A	Testing Circuitry	Figure A																																
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<div><div><div><div>---</div><div>□</div><div>---</div></div><div>Load 50%</div></div><div><div>—</div><div>△</div><div>—</div></div><div>Load 100%</div></div> <p>Note: Slanted line shows the range of the rated input voltage.</p>		<table><tr><th rowspan="2">Input Voltage [V]</th><th colspan="2">Output Voltage [V]</th></tr><tr><th>Load 50%</th><th>Load 100%</th></tr><tr><td>80</td><td>15.321</td><td>-</td></tr><tr><td>85</td><td>15.322</td><td>-</td></tr><tr><td>100</td><td>15.324</td><td>15.315</td></tr><tr><td>120</td><td>15.324</td><td>15.315</td></tr><tr><td>200</td><td>15.322</td><td>15.315</td></tr><tr><td>230</td><td>15.323</td><td>15.315</td></tr><tr><td>264</td><td>15.324</td><td>15.314</td></tr><tr><td>280</td><td>15.325</td><td>15.316</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Input Voltage [V]	Output Voltage [V]		Load 50%	Load 100%	80	15.321	-	85	15.322	-	100	15.324	15.315	120	15.324	15.315	200	15.322	15.315	230	15.323	15.315	264	15.324	15.314	280	15.325	15.316	--	-	-
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Item		Load Regulation		Testing CircuitryFigure A	
Object		+15V70A			
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> <div><div><div>Output Voltage [V]</div><div><div><div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div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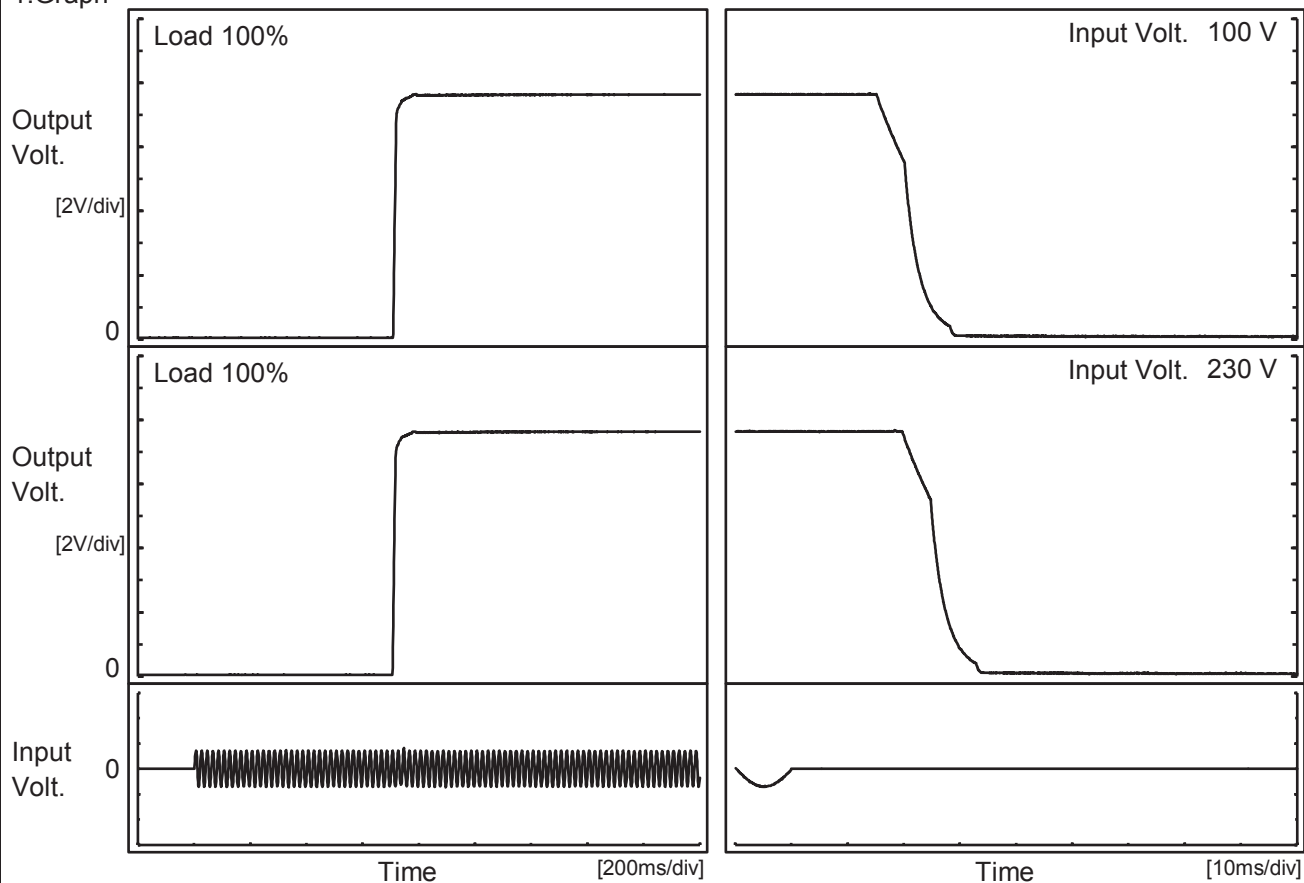
Model		PCA1000F-15	Temperature 25°C Testing Circuitry Figure A
Item		Dynamic Load Response	
Object		+15V70A	



# COSEL

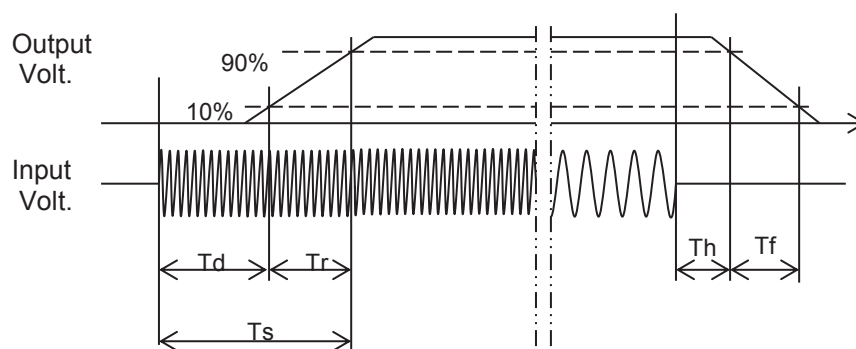
Model	PCA1000F-15	Temperature	25°C
Item	Rise and Fall Time	Testing Circuitry	Figure A
Object	+15V70A		

## 1. Graph



## 2. Values

Input Volt.	Time	Td	Tr	Ts	Th	Tf
100 V		711.0	9.0	720.0	16.9	8.7
230 V		708.0	9.0	717.0	21.5	8.9



Model		PCA1000F-15		Temperature		25°C																																	
Item		Hold-Up Time		Testing Circuitry		Figure A																																	
Object		+15V70A																																					
1.Graph				2.Values																																			
<div><div><div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div><div></div><div></div><div></div></div><div><div></div><div></div><div></div></div></div><div>Load 50%</div><div>Load 100%</div></div> <div><div><div>Hold-Up Time [ms]</div><div>1000</div><div>100</div><div>10</div><div>1</div></div><div><div>50</div><div>100</div><div>150</div><div>200</div><div>250</div><div>300</div></div><div><div>Input Voltage [V]</div></div></div>				<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>80</td><td>31</td><td>-</td></tr><tr><td>85</td><td>31</td><td>-</td></tr><tr><td>100</td><td>31</td><td>15</td></tr><tr><td>120</td><td>31</td><td>15</td></tr><tr><td>200</td><td>40</td><td>20</td></tr><tr><td>230</td><td>40</td><td>20</td></tr><tr><td>264</td><td>40</td><td>20</td></tr><tr><td>280</td><td>42</td><td>20</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>				Input Voltage [V]	Hold-Up Time [ms]		Load 50%	Load 100%	80	31	-	85	31	-	100	31	15	120	31	15	200	40	20	230	40	20	264	40	20	280	42	20	--	-	-
Input Voltage [V]	Hold-Up Time [ms]																																						
	Load 50%	Load 100%																																					
80	31	-																																					
85	31	-																																					
100	31	15																																					
120	31	15																																					
200	40	20																																					
230	40	20																																					
264	40	20																																					
280	42	20																																					
--	-	-																																					
<p>This duration covers from Shut-off of input voltage to the moment when output voltage descends to the rated range of voltage accuracy.</p> <p>Note: Slanted line shows the range of the rated input voltage.</p>																																							

Model		PCA1000F-15		Temperature25°C Testing CircuitryFigure A																																																			
Item		Instantaneous Interruption Compensation																																																					
Object		+15V70A																																																					
1.Graph																																																							
<div><div><div><div><div></div><div></div></div><div><div></div><div></div></div><div><div></div><div></div></div></div><div><div>—△—</div><div>Input Volt. 100V</div></div><div><div>---□---</div><div>Input Volt. 200V</div></div><div><div>-·-○-·-</div><div>Input Volt. 230V</div></div></div><div><div><div><div>Instantaneous Compensation Time [ms]</div><div>1000</div><div>100</div><div>10</div><div>1</div></div><div><div>0</div><div>20</div><div>40</div><div>60</div><div>80</div></div><div><div>Load Current [A]</div></div></div></div></div>																																																							
Note: Slanted line shows the range of the rated load current.																																																							
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>10.0</td><td>87</td><td>119</td><td>114</td></tr><tr><td>20.0</td><td>53</td><td>65</td><td>69</td></tr><tr><td>30.0</td><td>46</td><td>55</td><td>57</td></tr><tr><td>40.0</td><td>35</td><td>43</td><td>43</td></tr><tr><td>50.0</td><td>26</td><td>33</td><td>34</td></tr><tr><td>60.0</td><td>20</td><td>26</td><td>28</td></tr><tr><td>70.0</td><td>15</td><td>21</td><td>21</td></tr><tr><td>77.0</td><td>14</td><td>20</td><td>20</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	-	-	-	10.0	87	119	114	20.0	53	65	69	30.0	46	55	57	40.0	35	43	43	50.0	26	33	34	60.0	20	26	28	70.0	15	21	21	77.0	14	20	20	--	-	-	-	--	-	-	-
Load Current [A]	Time [ms]																																																						
	Input Volt. 100[V]	Input Volt. 200[V]	Input Volt. 230[V]																																																				
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40.0	35	43	43																																																				
50.0	26	33	34																																																				
60.0	20	26	28																																																				
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77.0	14	20	20																																																				
--	-	-	-																																																				
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Model		PCA1000F-15	Temperature Testing Circuitry	25°C Figure A																																									
Item		Overcurrent Protection																																											
Object		+15V70A																																											
1.Graph			2.Values																																										
<div><div><div></div><div>Input Volt. 100V</div></div><div><div></div><div>Input Volt. 230V</div></div></div> <p>Note: Slanted line shows the range of the rated load current.</p> <p>Hiccup mode activates when the output voltage is from 7.5 to 0V.</p>			<table><tr><th rowspan="2">Output Voltage [V]</th><th colspan="2">Load Current [A]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>14.3</td><td>79.30</td><td>79.22</td></tr><tr><td>13.5</td><td>79.30</td><td>79.22</td></tr><tr><td>12.0</td><td>79.41</td><td>79.21</td></tr><tr><td>10.5</td><td>79.54</td><td>79.26</td></tr><tr><td>9.0</td><td>79.44</td><td>79.32</td></tr><tr><td>7.5</td><td>79.39</td><td>79.45</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr><tr><td>--</td><td>-</td><td>-</td></tr></table>		Output Voltage [V]	Load Current [A]		Input Volt. 100[V]	Input Volt. 230[V]	14.3	79.30	79.22	13.5	79.30	79.22	12.0	79.41	79.21	10.5	79.54	79.26	9.0	79.44	79.32	7.5	79.39	79.45	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-	--	-	-
Output Voltage [V]	Load Current [A]																																												
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Model	PCA1000F-15		
Item	Ambient Temperature Drift	Testing Circuitry    Figure A	
Object	+15V70A		
1.Values <span style="float:right">Load 100%</span>			
Ambient Temperature[°C]	Output Voltage [V]		
	Input Volt. 100V	Input Volt. 200V	Input Volt. 230V
-20	15.231	15.231	15.231
25	15.308	15.308	15.308
40	15.340	15.340	15.340
Item	Minimum Input Voltage for Regulated Output Voltage	Testing Circuitry    Figure A	
Object	+15V70A		
1.Values			
Ambient Temperature[°C]	Input Voltage [V]		
	Load 50%	Load 100%	
-20	73	79	
25	74	78	
40	74	79	
Item	Overvoltage Protection	Testing Circuitry    Figure A	
Object	+15V70A		
1.Values <span style="float:right">Load 0%</span>			
Ambient Temperature[°C]	Operating Point [V]		
	Input Volt. 100V	Input Volt. 230V	
-20	19.27	19.27	
25	19.26	19.26	
40	19.26	19.26	

- 13 -

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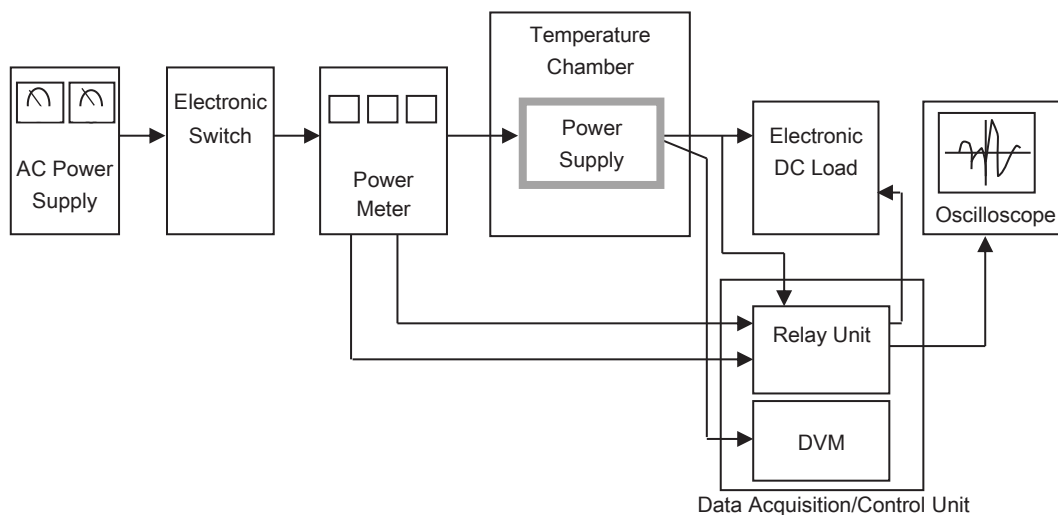


Figure A

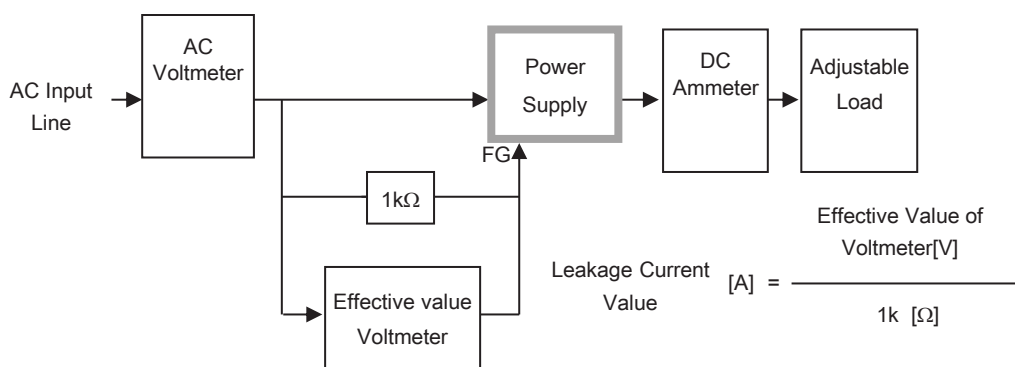


Figure B-1 ( DEN-AN )

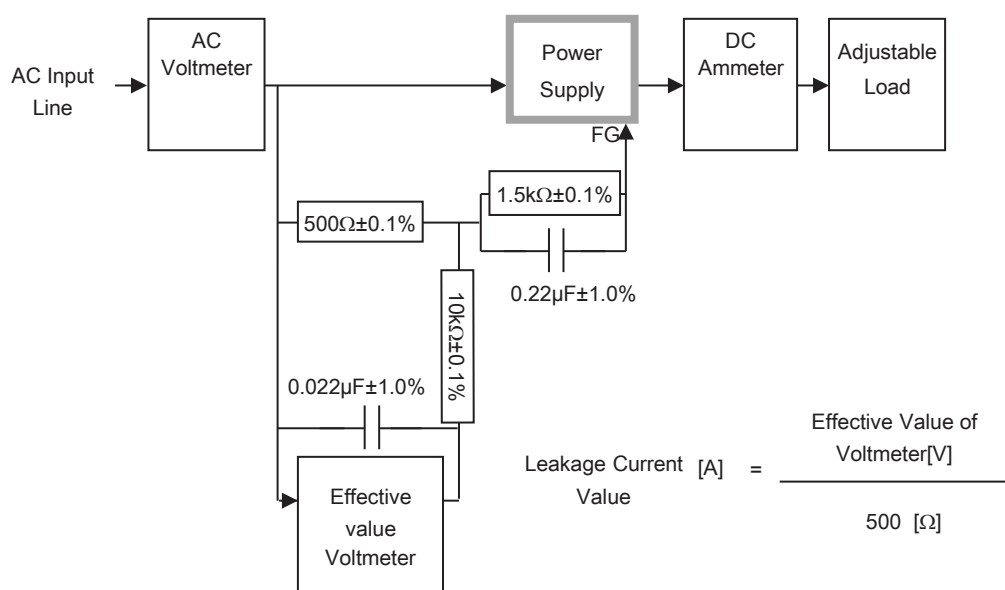


Figure B-2 ( IEC62368-1 refer to IEC60990 Fig.4 )

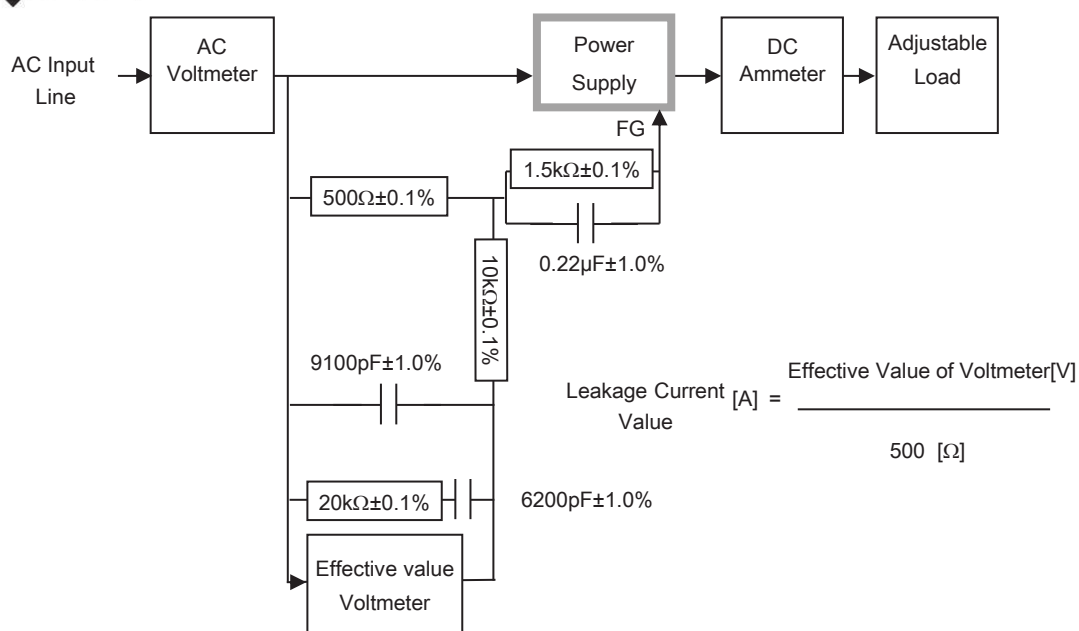


Figure B-3 ( IEC62368-1 refer to IEC60990 Fig.5 )

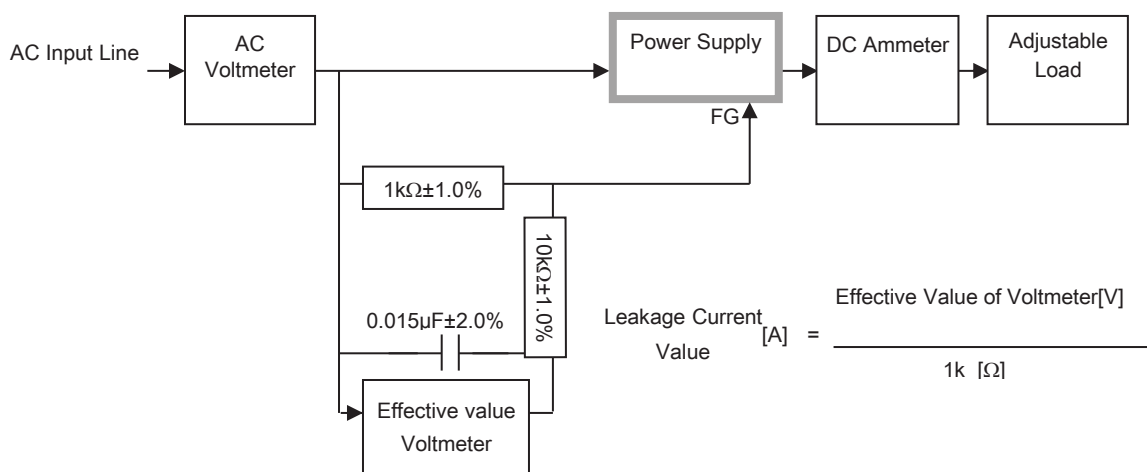


Figure B-4 ( IEC60601-1)

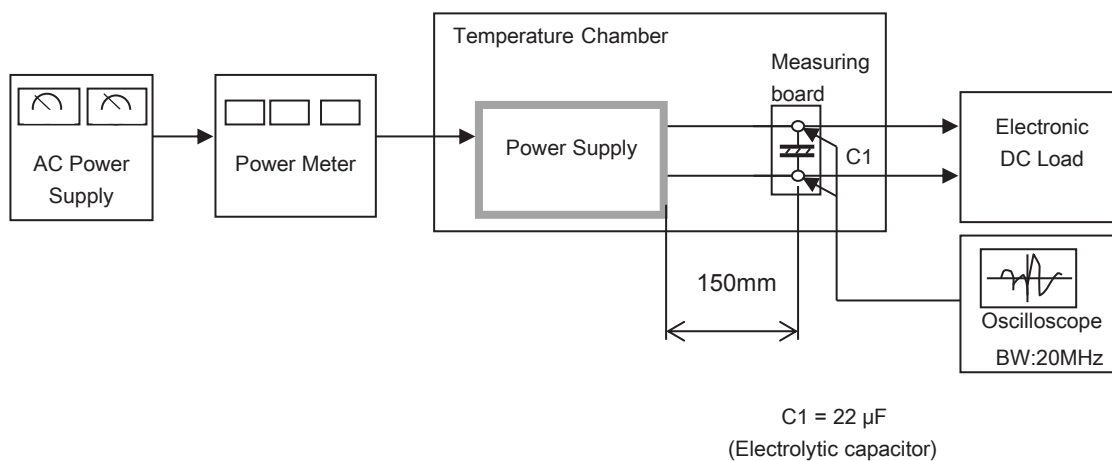


Figure C