

TEST DATA OF PJA1000F-24

Regulated DC Power Supply
May 2, 2017

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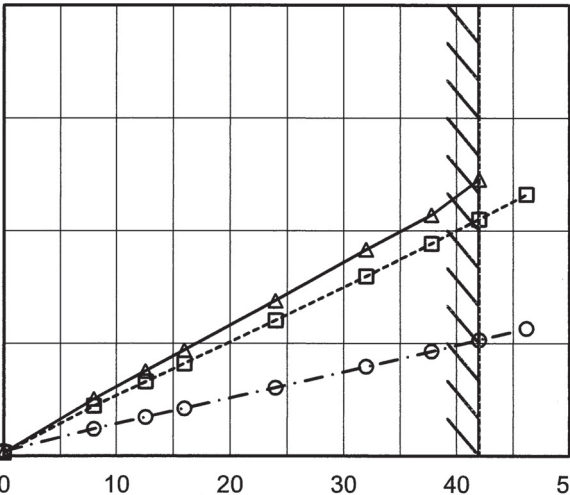
COSEL CO.,LTD.

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<div><div><div>—△—</div><div>---□---</div><div>-○-</div></div><div><div>Input Volt. 100V</div><div>Input Volt. 115V</div><div>Input Volt. 230V</div></div></div> <p>Efficiency [%]</p> <p>Load Current [A]</p>				<table><tr><th rowspan="2">Load Current [A]</th><th colspan="3">Efficiency [%]</th></tr><tr><th>Input Volt. 100[V]</th><th>Input Volt. 115[V]</th><th>Input Volt. 230[V]</th></tr><tr><td>0.0</td><td>-</td><td>-</td><td>-</td></tr><tr><td>8.0</td><td>79.3</td><td>78.7</td><td>80.2</td></tr><tr><td>12.6</td><td>82.6</td><td>82.3</td><td>84.0</td></tr><tr><td>16.0</td><td>83.9</td><td>83.7</td><td>85.6</td></tr><tr><td>24.0</td><td>85.3</td><td>85.1</td><td>87.4</td></tr><tr><td>32.0</td><td>85.4</td><td>85.5</td><td>88.1</td></tr><tr><td>37.8</td><td>84.5</td><td>85.4</td><td>88.1</td></tr><tr><td>42.0</td><td>84.0</td><td>85.2</td><td>88.2</td></tr><tr><td>46.2</td><td>-</td><td>84.9</td><td>88.2</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]	Efficiency [%]			Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]	0.0	-	-	-	8.0	79.3	78.7	80.2	12.6	82.6	82.3	84.0	16.0	83.9	83.7	85.6	24.0	85.3	85.1	87.4	32.0	85.4	85.5	88.1	37.8	84.5	85.4	88.1	42.0	84.0	85.2	88.2	46.2	-	84.9	88.2	--	-	-	-	--	-	-	-
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COSEL

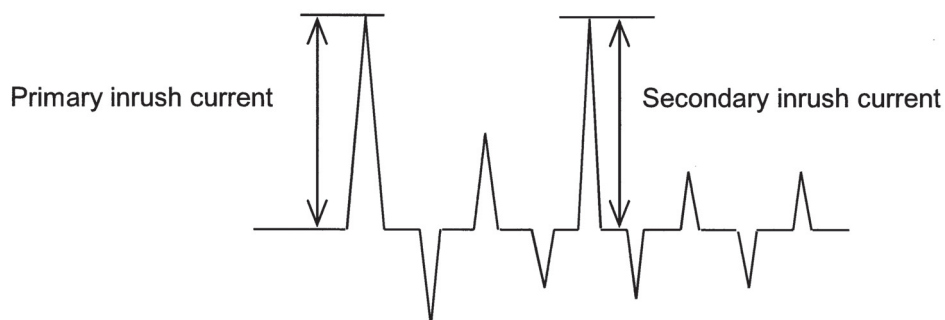
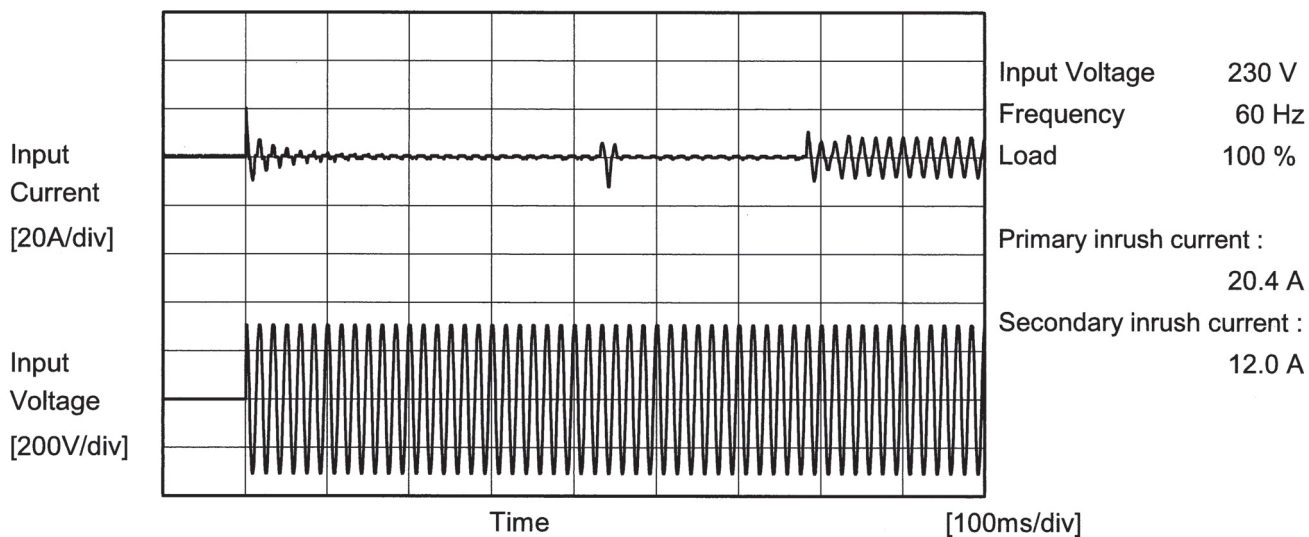
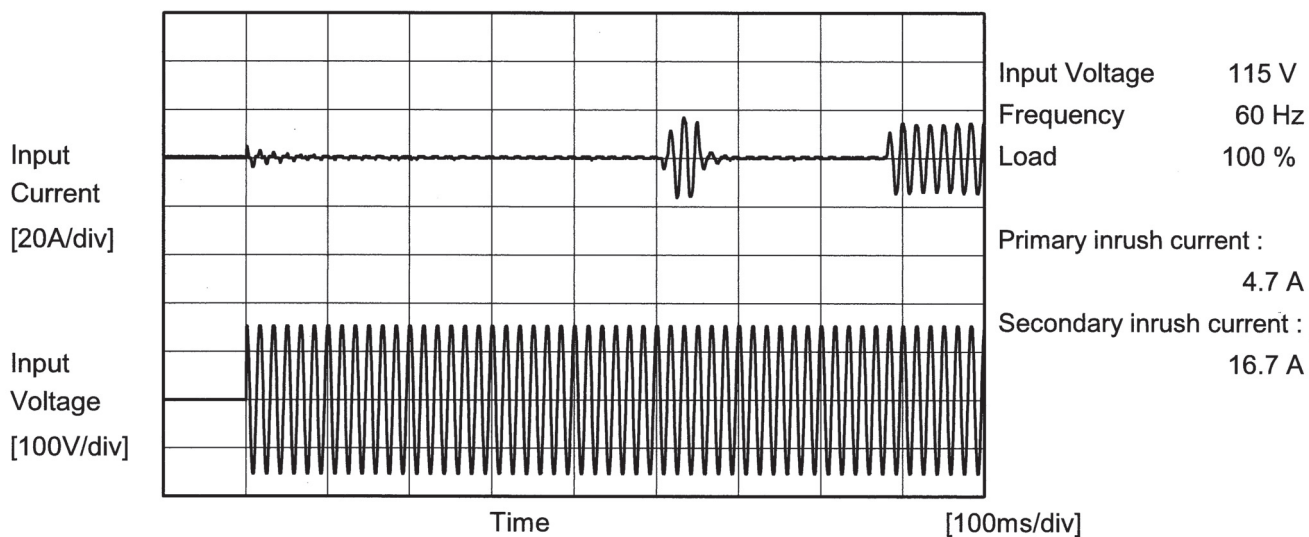
Model		PJA1000F-24	Temperature Testing Circuitry	25°C Figure A																														
Item		Power Factor (by Input Voltage)																																
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Input Voltage [V]	Load 50%	Load 100%																																
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Model		PJA1000F-24		Temperature		25°C																																																				
Item		Power Factor (by Load Current)		Testing Circuitry		Figure A																																																				
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Load Current [A]	Power Factor																																																									
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Note: Slanted line shows the range of the rated load current.																																																										

COSEL

Model		PJA1000F-24	Temperature 25°C Testing Circuitry Figure A
Item		Inrush Current	
Object		_____	





Model		PJA1000F-24	Temperature 25°C Testing Circuitry Figure B
Item		Leakage Current	
Object		_____	

1.Results

[mA]

Standards	Testing Circuitry	Measuring Method	Input Volt.			Note
			100 [V]	115 [V]	240 [V]	
DEN-AN	Figure B-1	Both phases	0.28	0.32	0.70	Operation
		One of phases	0.52	0.60	1.35	Stand by
IEC62368-1	Figure B-2	Both phases	0.24	0.27	0.59	Operation
		One of phases	0.43	0.50	1.10	Stand by
	Figure B-3	Both phases	0.24	0.27	0.59	Operation
		One of phases	0.43	0.50	1.10	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		PJA1000F-24	
Item		Line Regulation	
Object		+24V42A	
1.Graph		2.Values	

</

Temperature 25°C
Testing Circuitry Figure A



Load Current [A]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.0	24.371	24.371	24.371
8.0	24.369	24.368	24.368
12.6	24.368	24.368	24.367
16.0	24.368	24.367	24.367
24.0	24.367	24.367	24.366
32.0	24.367	24.366	24.366
37.8	24.367	24.366	24.365
42.0	24.366	24.366	24.365
46.2	-	24.365	24.365
--	-	-	-
--	-	-	-

- 10 -

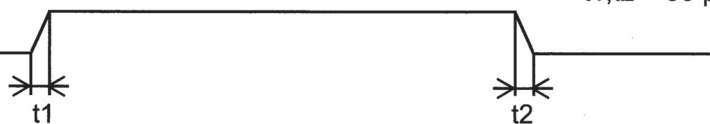
COSEL

Model	PJA1000F-24	Temperature	25°C
Item	Dynamic Load Response	Testing Circuitry	Figure A
Object	+24V42A		

Input Volt. 115 V
Cycle 1000 ms

$t_1, t_2 = 50 \mu s$ Typ

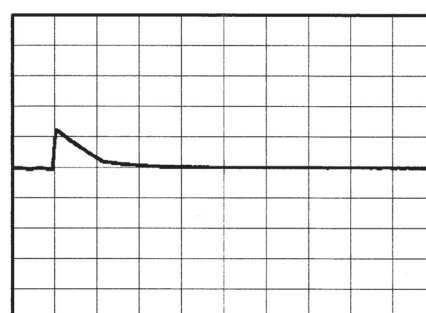
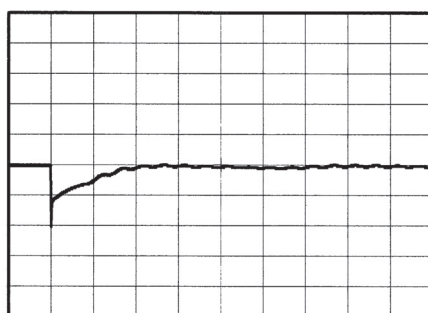
Load Current



Min.Load (0A) ←→
Load 100% (42A)

200 mV/div

20 ms/div

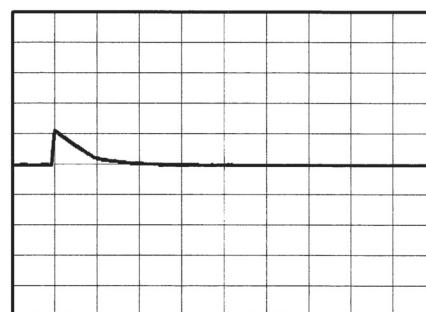
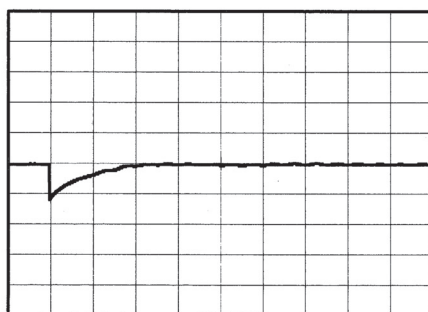


20 ms/div

Min.Load (0A) ←→
Load 50% (21A)

200 mV/div

20 ms/div

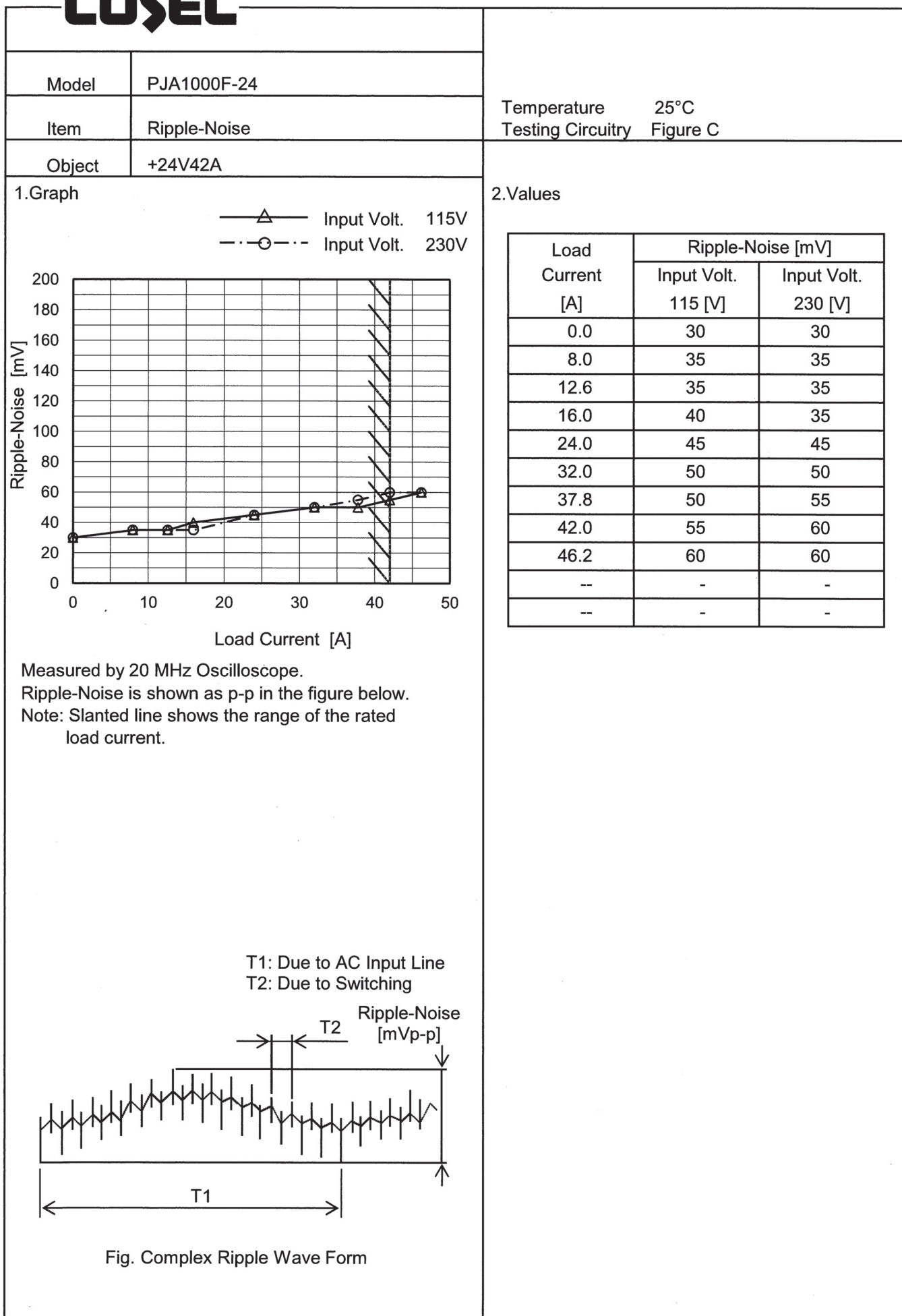


20 ms/div

COSEL

Model		PJA1000F-24	
Item		Ripple Voltage (by Load Current)	
Object		+24V42A	
1.Graph		2.Values	

COSEL



COSEL

Model		PJA1000F-24
Item		Ripple Voltage (by Ambient Temp.)
Object		+24V42A

1.Graph

□

Input Volt. 115V

—

△

—

Input Volt. 230V

200

180

160

140

120

100

80

60

40

20

0

Ripple Voltage [mV]

-40

-20

0



20

40

60

Ambient Temperature [°C]

Testing Circuitry Figure A

	Input Volt.	100V
	Input Volt.	115V
	Input Volt.	230V



2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
-30	24.266	24.265	24.265
-20	24.289	24.288	24.288
-10	24.309	24.309	24.309
0	24.327	24.327	24.328
10	24.341	24.342	24.342
25	24.359	24.359	24.360
30	24.361	24.361	24.361
40	24.373	24.372	24.373
50	24.380	24.380	24.380
60	24.388	24.388	24.388
--	-	-	-

Note: In case of Input Volt. 100V, Load 90%.
Other case Load 100%.

COSEL

Model		PJA1000F-24	Testing Circuitry Figure A
Item		Output Voltage Accuracy	
Object		+24V42A	

1. Output Voltage Accuracy

This is defined as the value of the output voltage, regulation load, ambient temperature and input voltage varied at random in the range as specified below.

Temperature : -20 - 50°C

Input Voltage : 115 - 264V

Load Current : 0 - 42A

* Output Voltage Accuracy = $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

* Output Voltage Accuracy (Ratio) = $\frac{\text{Output Voltage Accuracy}}{\text{Rated Output Voltage}} \times 100$

2. Values

Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	50	230	0	24.384	±48	±0.2
Minimum Voltage	-20	230	42	24.288		

COSEL

Model		PJA1000F-24	
Item		Time Lapse Drift	
Object		+24V42A	

1.Graph

25.00

24.00

23.00

0

2

4

6

8

10

Output Voltage [V]

Time [H]

Input Volt.230V

Load100%

* The characteristic of AC115V is equal.

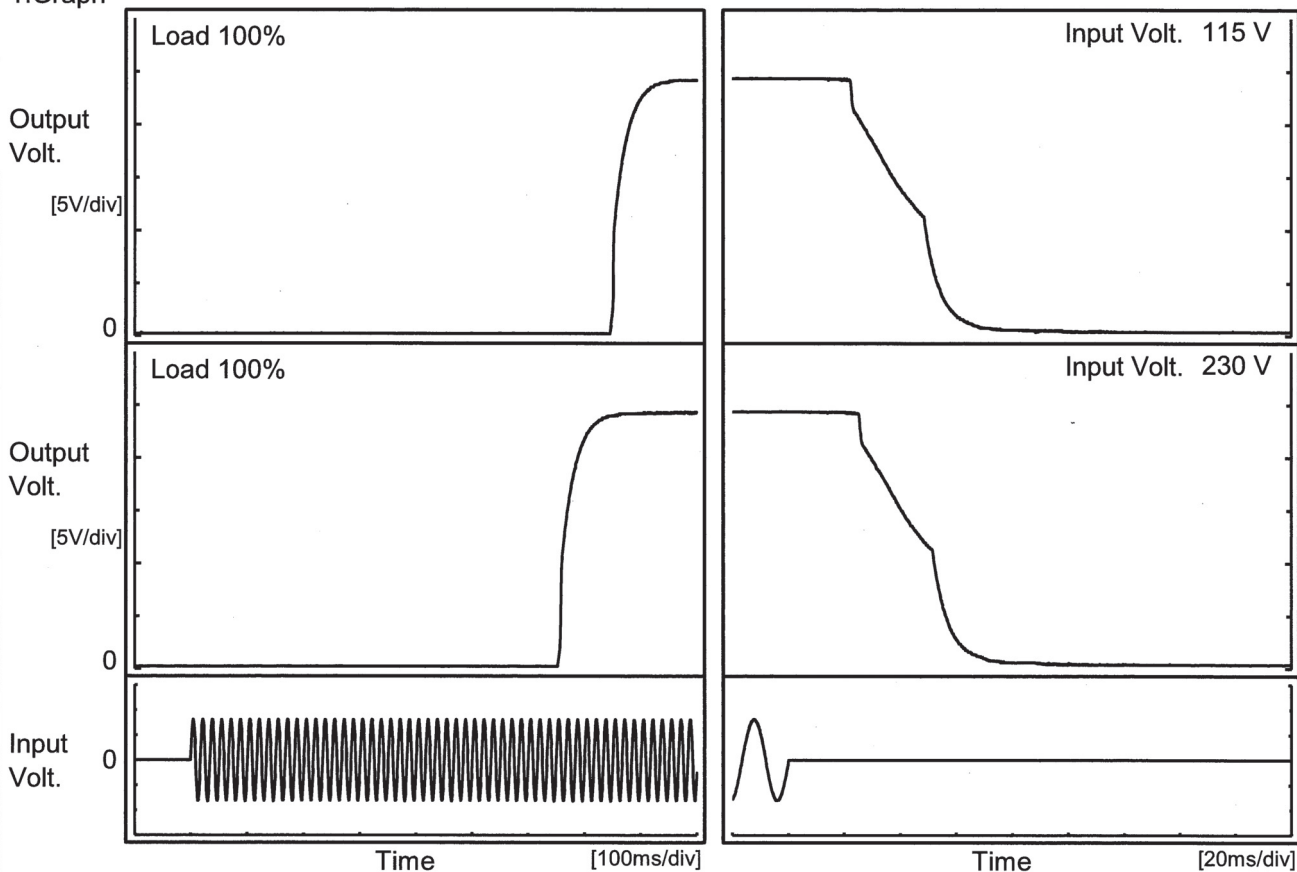
2.Values

Time since start [H]	Output Voltage [V]
0.0	24.358
0.5	24.368
1.0	24.368
2.0	24.367
3.0	24.367
4.0	24.367
5.0	24.367
6.0	24.367
7.0	24.367
8.0	24.367

COSEL

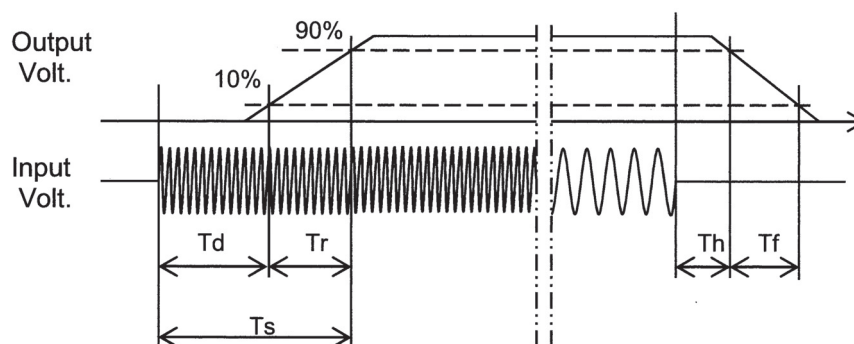
Model	PJA1000F-24	Temperature 25°C Testing Circuitry Figure A
Item	Rise and Fall Time	
Object	+24V42A	

1. Graph



2. Values

		[ms]				
Input Volt.	Time	Td	Tr	Ts	Th	Tf
115 V		751.0	43.0	794.0	23.2	34.5
230 V		658.0	43.5	701.5	26.1	34.4



COSEL

Model		PJA1000F-24	
Item		Hold-Up Time	
Object		+24V42A	

1.Graph

□

Load 50%

△

Load 100%

Hold-Up Time [ms]

1000

100

10

1

50

100

150

200

250

300

Input Voltage [V]

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.

2.Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
85	47	28 ※1
100	48	25 ※2
115	49	22
200	54	24
230	55	25
264	55	26
280	55	27
--	-	-
--	-	-

※1:Load 80%

※2:Load 90%

COSEL

Model		PJA1000F-24	
Item		Instantaneous Interruption Compensation	
Object		+24V42A	
1.Graph		2.Values	

—△—

Input Volt.

100V

---□---

Input Volt.

115V

-·-○-·-

Input Volt.

230V

Instantaneous Compensation Time [ms]

Load Current [A]

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

Load Current [A]	Time [ms]		
	Input Volt. 100[V]	Input Volt. 115[V]	Input Volt. 230[V]
0.0	-	-	-
8.0	20	29	140
12.6	20	27	87
16.0	20	27	72
24.0	20	27	48
32.0	20	27	37
37.8	20	26	30
42.0	20	21	27
46.2	-	19	22
--	-	-	-
--	-	-	-

COSEL

Model

PJA1000F-24

Item

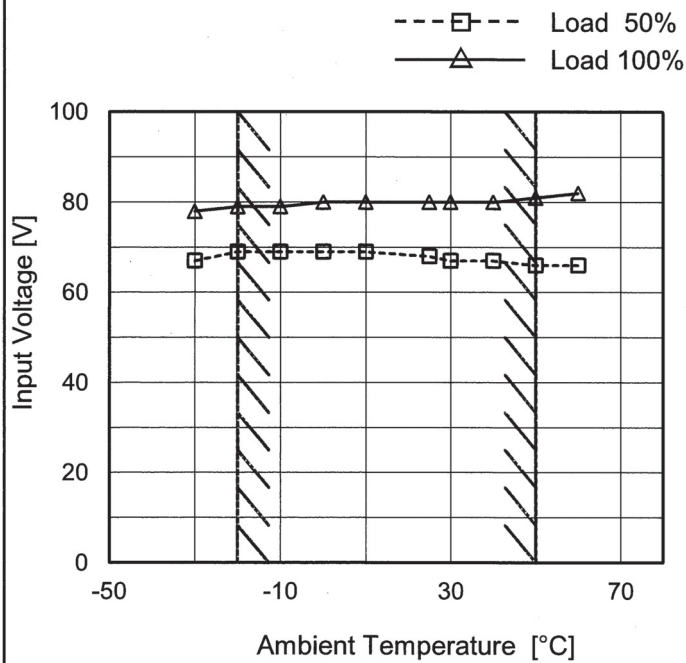
Minimum Input Voltage
for Regulated Output Voltage

Object

+24V42A

Testing Circuitry Figure A

1. Graph



Note: Slanted line shows the range of the rated ambient temperature.

2. Values

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-30	67	78
-20	69	79
-10	69	79
0	69	80
10	69	80
25	68	80
30	67	80
40	67	80
50	66	81
60	66	82
--	-	-

COSEL

Model		PJA1000F-24		Temperature		25°C																																													
Item		Overcurrent Protection		Testing Circuitry		Figure A																																													
Object		+24V42A																																																	
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COSEL

Model		PJA1000F-24																																						
Item		Overvoltage Protection																																						
Object		+24V42A																																						
1.Graph		Testing Circuitry Figure A																																						
<p>—△— Input Volt. 115V ---□--- Input Volt. 230V</p> <p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p> <p>Note: Slanted line shows the range of the rated ambient temperature.</p>		2.Values																																						
		<table> <tr> <th rowspan="2">Ambient Temperature [°C]</th><th colspan="2">Operating Point [V]</th></tr> <tr> <th>Input Volt. 115[V]</th><th>Input Volt. 230[V]</th></tr> <tr><td>-30</td><td>30.86</td><td>30.75</td></tr> <tr><td>-20</td><td>31.04</td><td>31.04</td></tr> <tr><td>-10</td><td>31.27</td><td>31.27</td></tr> <tr><td>0</td><td>31.44</td><td>31.44</td></tr> <tr><td>10</td><td>31.73</td><td>31.73</td></tr> <tr><td>25</td><td>32.03</td><td>32.03</td></tr> <tr><td>30</td><td>32.15</td><td>32.14</td></tr> <tr><td>40</td><td>32.32</td><td>32.32</td></tr> <tr><td>50</td><td>32.62</td><td>32.62</td></tr> <tr><td>60</td><td>32.85</td><td>32.73</td></tr> <tr><td>--</td><td>-</td><td>-</td></tr> </table>	Ambient Temperature [°C]	Operating Point [V]		Input Volt. 115[V]	Input Volt. 230[V]	-30	30.86	30.75	-20	31.04	31.04	-10	31.27	31.27	0	31.44	31.44	10	31.73	31.73	25	32.03	32.03	30	32.15	32.14	40	32.32	32.32	50	32.62	32.62	60	32.85	32.73	--	-	-
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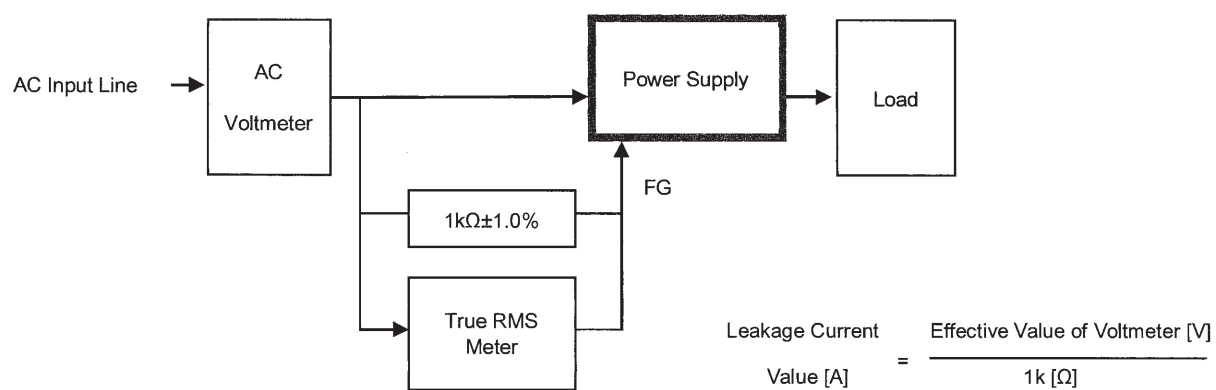
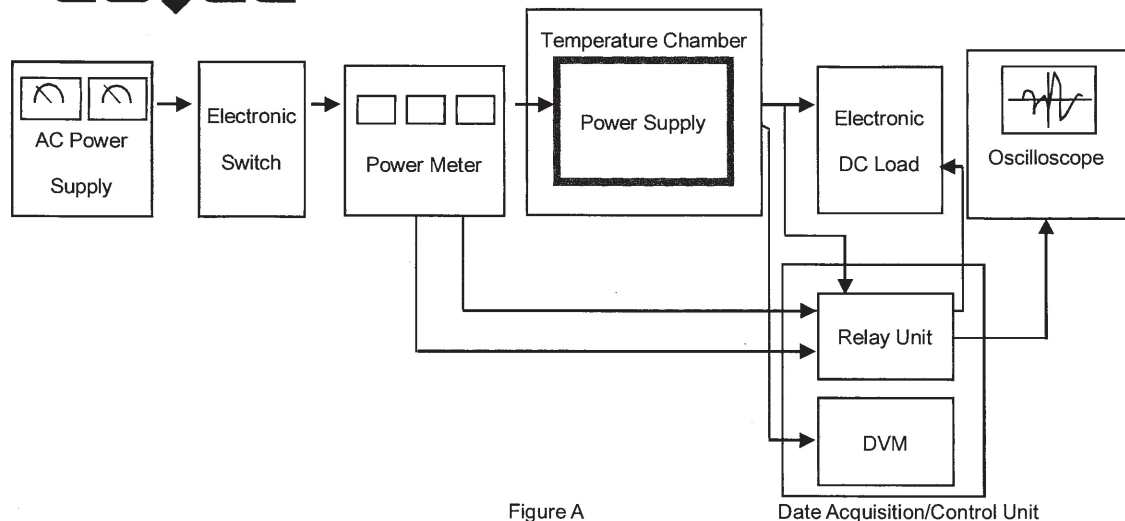


Figure B-1 (DEN-AN)

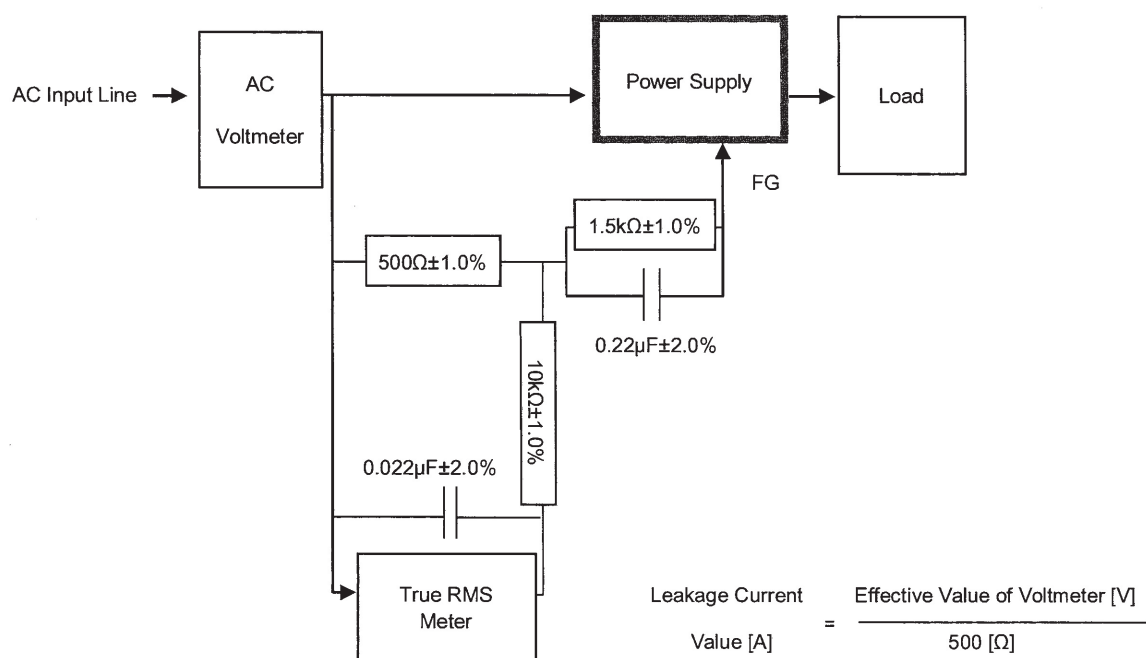


Figure B-2 (IEC62368-1 refer to IEC60990 Fig.4)

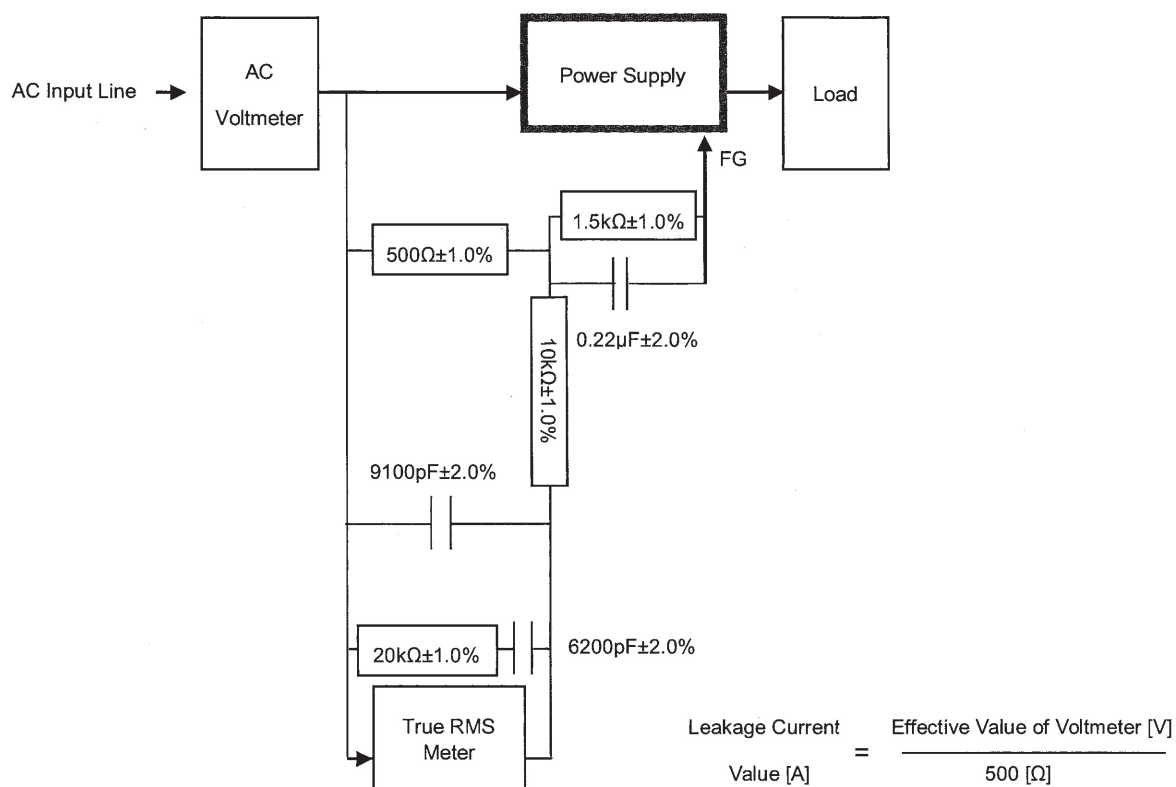


Figure B-3 (IEC62368-1 refer to IEC60990 Fig.5)

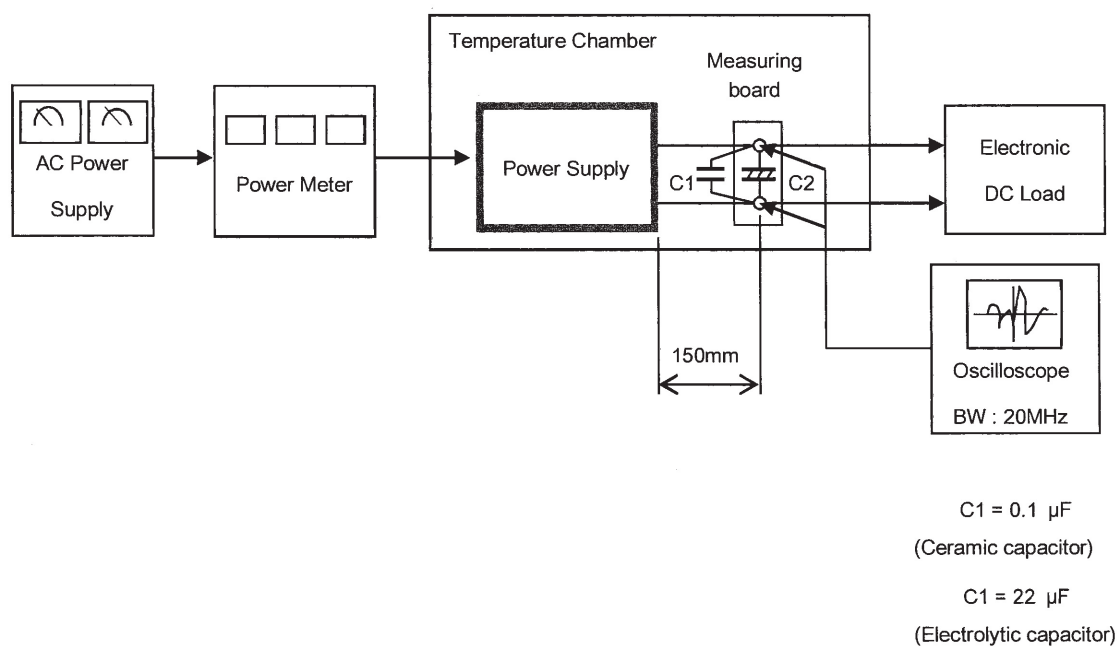


Figure C