参考資料

# TEST DATA OF PCA1500F-24

Regulated DC Power Supply
February 22, 2021

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Design Engineer

COSEL CO.,LTD.

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| | |
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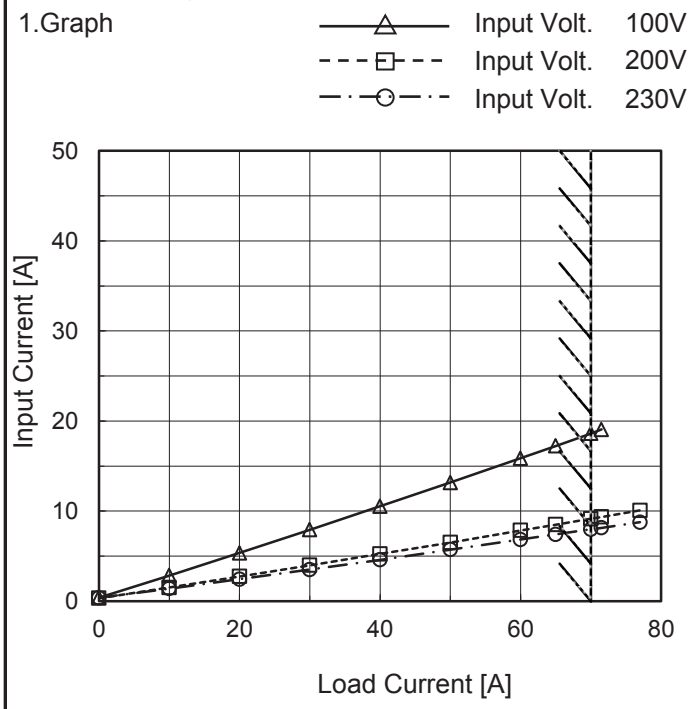
| Item | Input Current (by Load Current) |
| Object | ———————— |

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] | Input Current [A] | | |
|---|---|---|---|
| | Input Volt. 100[V] | Input Volt. 200[V] | Input Volt. 230[V] |
| 0.0 | 0.401 | 0.331 | 0.371 |
| 10.0 | 2.846 | 1.520 | 1.388 |
| 20.0 | 5.350 | 2.736 | 2.429 |
| 30.0 | 7.930 | 3.980 | 3.497 |
| 40.0 | 10.530 | 5.240 | 4.590 |
| 50.0 | 13.170 | 6.510 | 5.730 |
| 60.0 | 15.870 | 7.850 | 6.850 |
| 65.0 | 17.240 | 8.490 | 7.410 |
| 70.0 | 18.620 | 9.150 | 7.970 |
| 71.5 | 19.060 | 9.350 | 8.140 |
| 77.0 | - | 10.070 | 8.760 |

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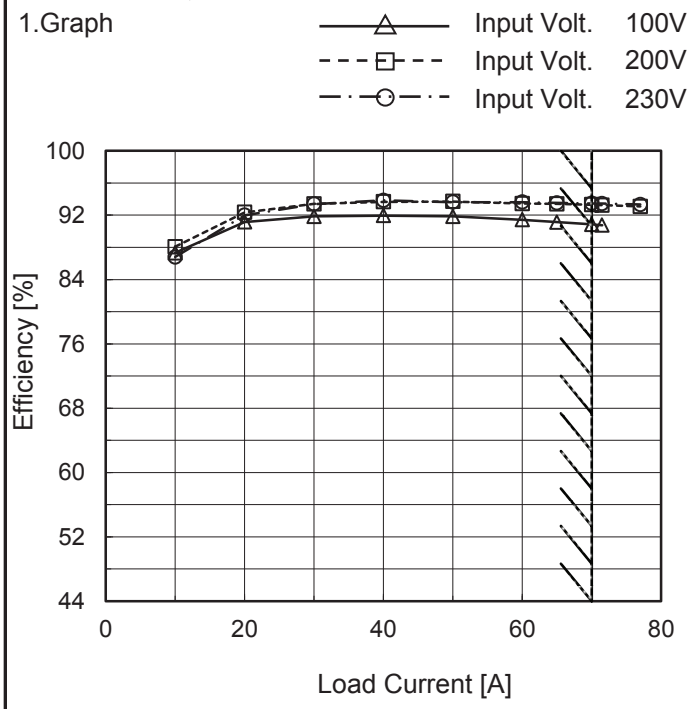
| | |
|---|---|
| Model | PCA1500F-24 |
| Item | Efficiency (by Load Current) |
| Object | ——————— |

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] | Efficiency [%] | | |
|---|---|---|---|
| | Input Volt. 100[V] | Input Volt. 200[V] | Input Volt. 230[V] |
| 0.0 | - | - | - |
| 10.0 | 87.3 | 88.1 | 86.8 |
| 20.0 | 91.2 | 92.3 | 92.0 |
| 30.0 | 91.9 | 93.4 | 93.4 |
| 40.0 | 91.9 | 93.7 | 93.8 |
| 50.0 | 91.8 | 93.7 | 93.6 |
| 60.0 | 91.4 | 93.4 | 93.6 |
| 65.0 | 91.1 | 93.4 | 93.5 |
| 70.0 | 90.8 | 93.3 | 93.5 |
| 71.5 | 90.7 | 93.2 | 93.4 |
| 77.0 | - | 93.1 | 93.3 |

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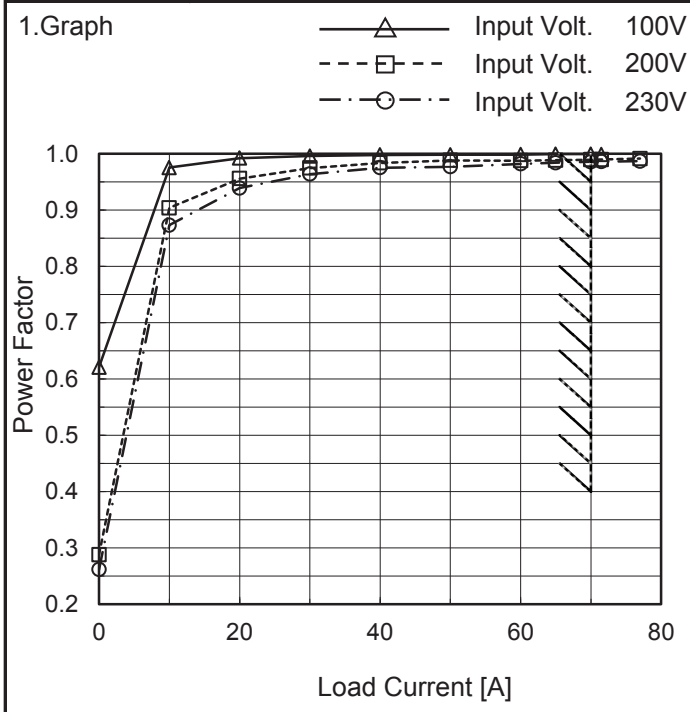
| | |
|---|---|
| Model | PCA1500F-24 |
| Item | Power Factor (by Load Current) |
| Object | ———————— |

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 | 0.621 | 0.288 | 0.261 |
| 10.0 | 0.976 | 0.904 | 0.873 |
| 20.0 | 0.993 | 0.956 | 0.939 |
| 30.0 | 0.996 | 0.975 | 0.964 |
| 40.0 | 0.998 | 0.984 | 0.975 |
| 50.0 | 0.998 | 0.988 | 0.977 |
| 60.0 | 0.999 | 0.988 | 0.982 |
| 65.0 | 0.999 | 0.989 | 0.984 |
| 70.0 | 0.999 | 0.990 | 0.986 |
| 71.5 | 0.999 | 0.990 | 0.986 |
| 77.0 | - | 0.992 | 0.987 |

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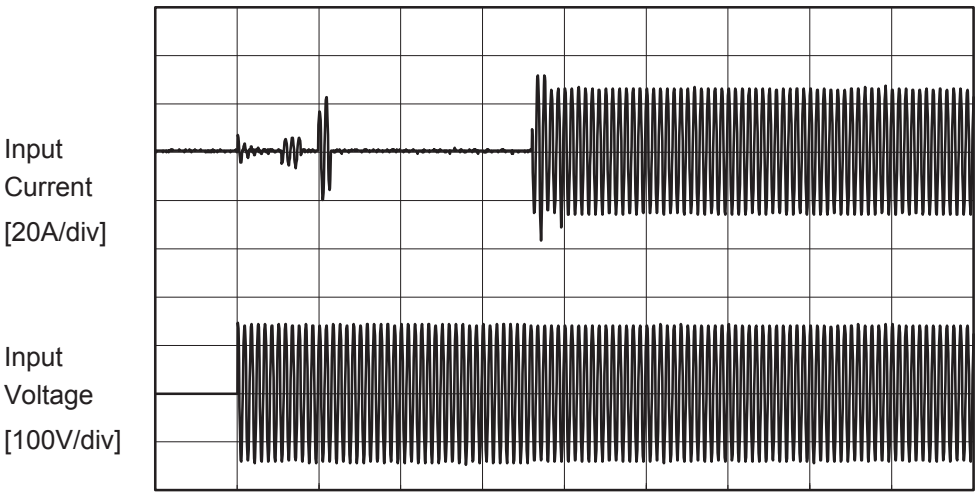
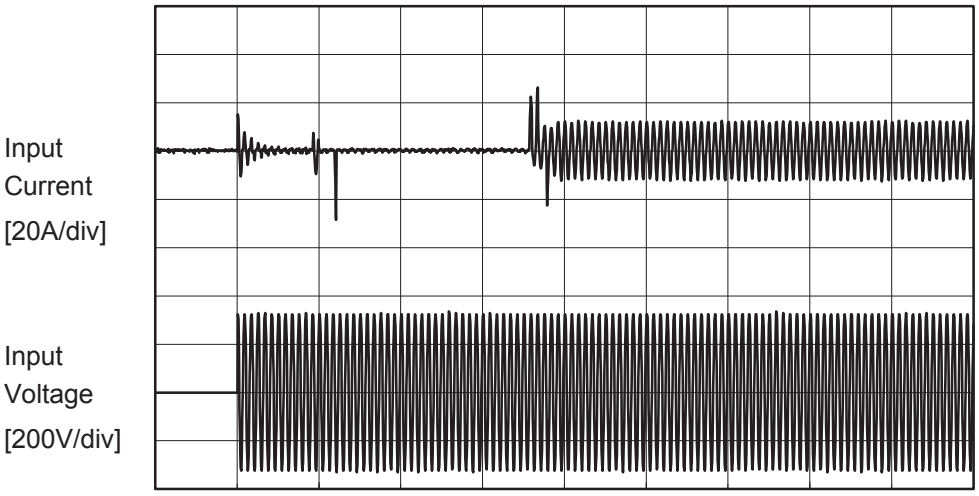
| | | |
|---|---|---|
| Model | PCA1500F-24 | |
| Item | Inrush Current | Temperature 25°C<br>Testing Circuitry Figure A |
| Object | ———————— | |



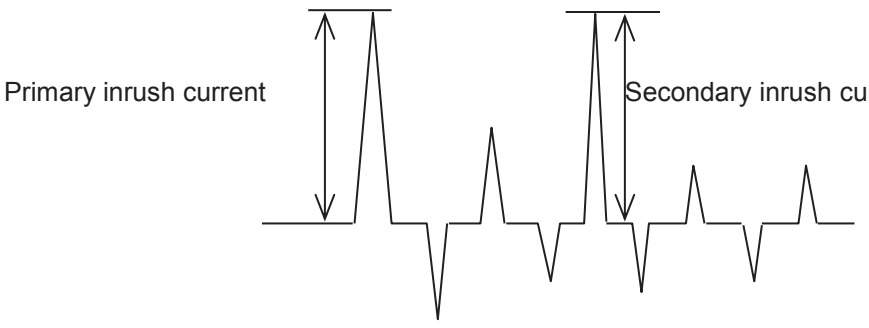

Input Voltage 100 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
7.0 A
Secondary inrush current :
36.8 A




Input Voltage 230 V
Frequency 60 Hz
Load 100 %

Primary inrush current :
15.3 A
Secondary inrush current :
28.5 A



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| | | |
|---|---|---|
| Model | PCA1500F-24 | |
| Item | Leakage Current | Temperature 25°C<br>Testing Circuitry Figure B |
| Object | ―――――――――― | |

[mA]

| Standards | Testing Circuitry | Measuring Method | Input Volt. | | | Note |
|---|---|---|---|---|---|---|
| | | | 100 [V] | 230 [V] | 240 [V] | |
| DEN-AN | Figure B-1 | Both phases | 0.23 | 0.28 | 0.29 | Operation |
| | | One of phases | 0.23 | 0.55 | 0.58 | Stand by |
| IEC62368-1 | Figure B-2 | Both phases | 0.15 | 0.27 | 0.29 | Operation |
| | | One of phases | 0.22 | 0.53 | 0.56 | Stand by |
| | Figure B-3 | Both phases | 0.22 | 0.30 | 0.32 | Operation |
| | | One of phases | 0.23 | 0.56 | 0.58 | Stand by |
| IEC60601-1 | Figure B-4 | Both phases | 0.18 | 0.28 | 0.30 | Operation |
| | | One of phases | 0.22 | 0.57 | 0.62 | Stand by |

Note:
The value of "One of phases" is for reference only.
The above value is the larger one of each phase of AC input.

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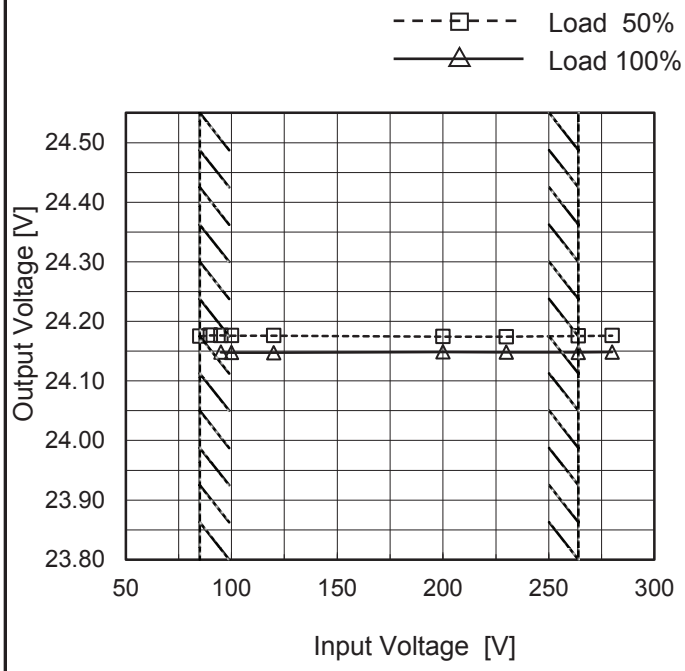
| | |
|---|---|
| Model | PCA1500F-24 |
| Item | Line Regulation |
| Object | +24V70A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




Note: Slanted line shows the range of the rated input voltage.

2.Values

| Input Voltage [V] | Output Voltage [V] | |
|---|---|---|
| | Load 50% | Load 100% |
| 85 | 24.175 | - |
| 90 | 24.177 | - |
| 95 | 24.176 | 24.148 |
| 100 | 24.176 | 24.148 |
| 120 | 24.176 | 24.147 |
| 200 | 24.175 | 24.149 |
| 230 | 24.174 | 24.148 |
| 264 | 24.176 | 24.148 |
| 280 | 24.176 | 24.148 |

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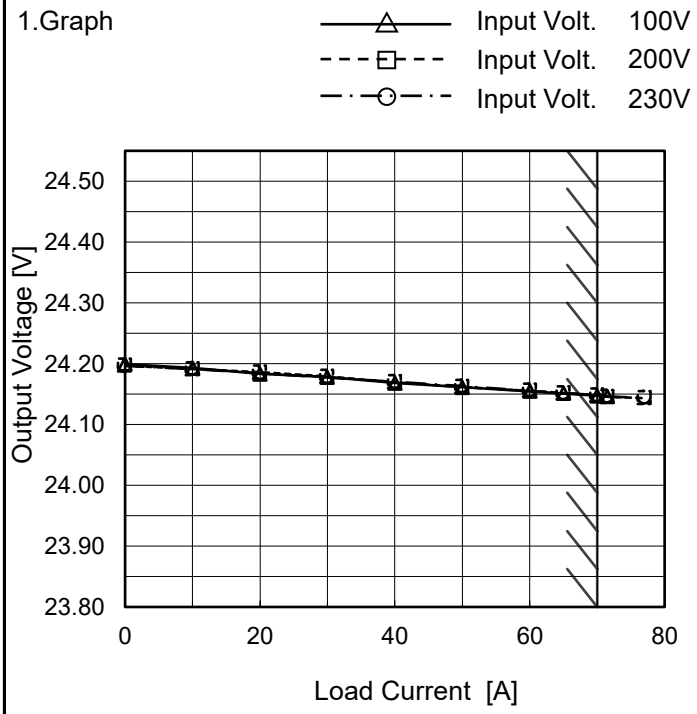
| | |
|---|---|
| Model | PCA1500F-24 |
| Item | Load Regulation |
| Object | +24V70A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

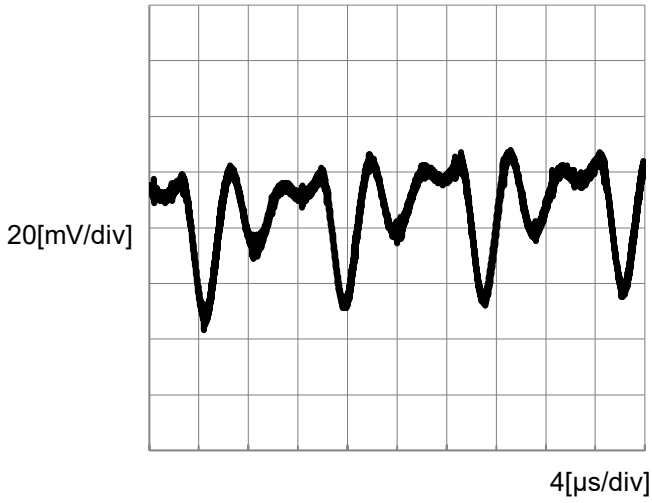
| Load Current [A] | Output Voltage [V] | | |
|---|---|---|---|
| | Input Volt. 100[V] | Input Volt. 200[V] | Input Volt. 230[V] |
| 0.0 | 24.199 | 24.197 | 24.196 |
| 10.0 | 24.193 | 24.191 | 24.191 |
| 20.0 | 24.183 | 24.186 | 24.184 |
| 30.0 | 24.178 | 24.179 | 24.178 |
| 40.0 | 24.168 | 24.169 | 24.170 |
| 50.0 | 24.161 | 24.162 | 24.163 |
| 60.0 | 24.155 | 24.156 | 24.155 |
| 65.0 | 24.151 | 24.152 | 24.152 |
| 70.0 | 24.147 | 24.148 | 24.148 |
| 71.5 | 24.146 | 24.146 | 24.146 |
| 77.0 | 0.000 | 24.143 | 24.144 |

| | |
|---|---|
| Item | Ripple-Noise |
| Object | +24V70A |

Temperature 25°C
Testing Circuitry Figure C

1.Graph

Input Voltage 200V
Load 100%



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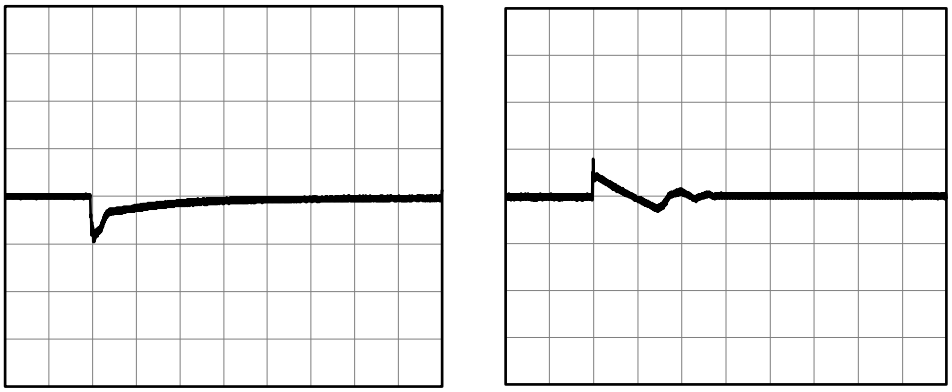
| | | | |
|---|---|---|---|
| Model | PCA1500F-24 | | |
| Item | Dynamic Load Response | Temperature<br>Testing Circuitry | 25°C<br>Figure A |
| Object | +24V70A | | |

Input Volt. 200 V

Cycle 1000 ms

Response. t1=t2=50µs. Typ

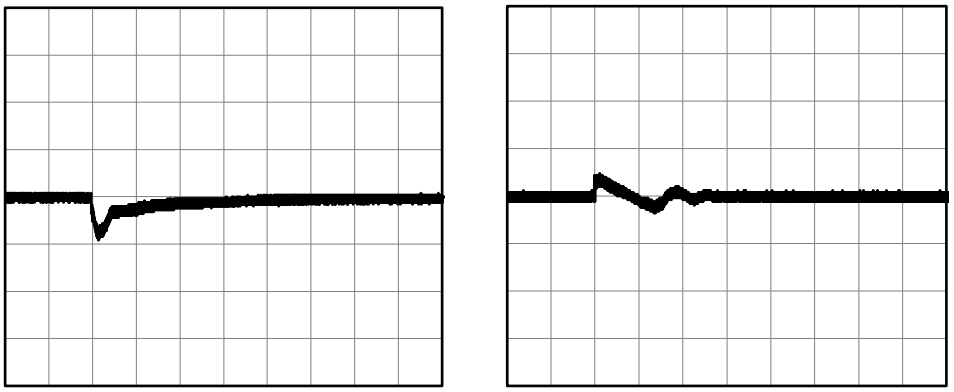

Load 0%(0A) ←→
Load 100%(70A)



2[V/div]

2[ms/div] 20[ms/div]

Load 0%(0A) ←→
Load 50%(35A)



2[V/div]

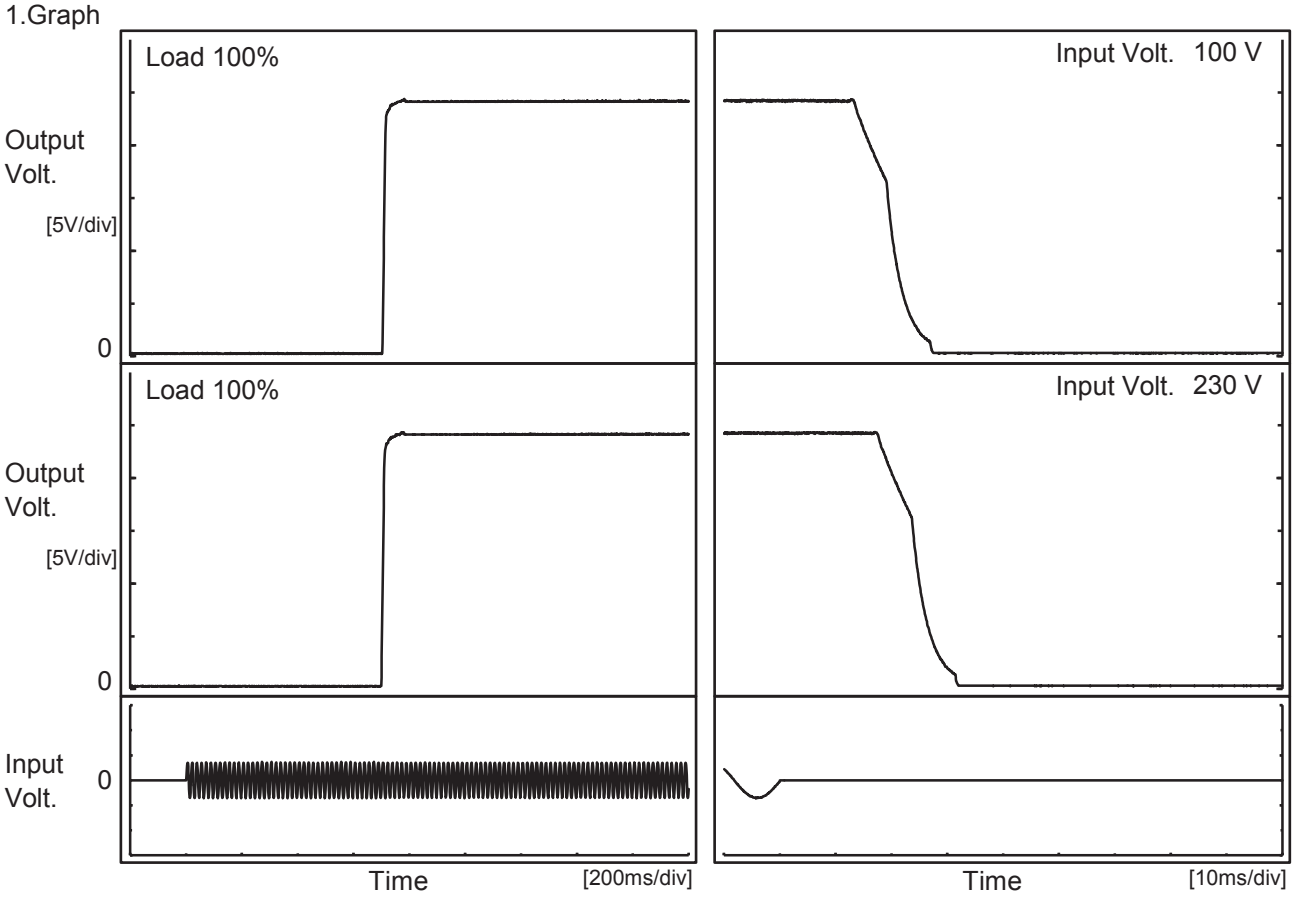
2[ms/div] 20[ms/div]

COSEL

| | |
|---|---|
| Model | PCA1500F-24 |
| Item | Rise and Fall Time |
| Object | +24V70A |

Temperature 25°C
Testing Circuitry Figure A

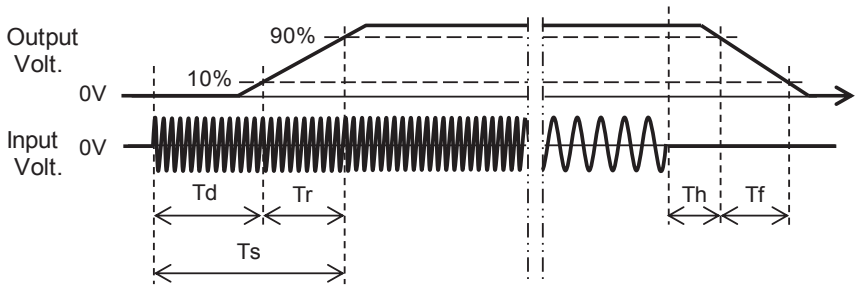
1.Graph




2.Values

[ms]

| Input Volt. \ Time | Td | Tr | Ts | Th | Tf |
|---|---|---|---|---|---|
| 100 V | 705.0 | 10.0 | 715.0 | 14.8 | 9.8 |
| 230 V | 701.0 | 11.0 | 712.0 | 19.1 | 10.1 |

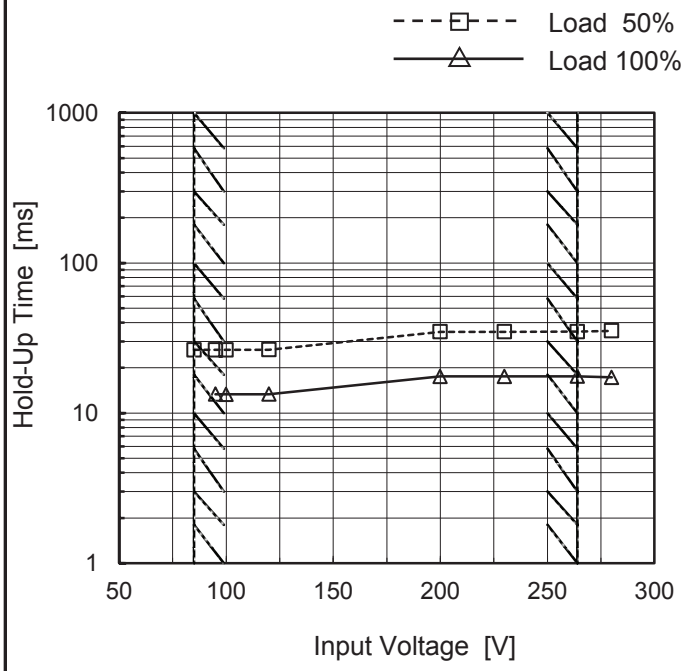


COSEL

| | |
|---|---|
| Model | PCA1500F-24 |
| Item | Hold-Up Time |
| Object | +24V70A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

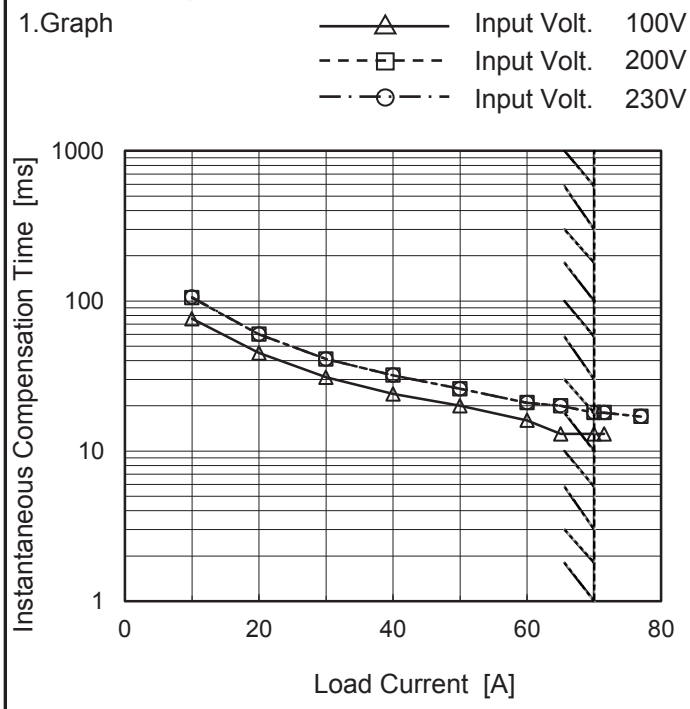
| Input Voltage [V] | Hold-Up Time [ms] | |
|---|---|---|
| | Load 50% | Load 100% |
| 85 | 26 | - |
| 90 | 26 | - |
| 95 | 26 | 13 |
| 100 | 26 | 13 |
| 120 | 26 | 13 |
| 200 | 35 | 18 |
| 230 | 35 | 18 |
| 264 | 35 | 18 |
| 280 | 35 | 17 |

COSEL

| | |
|---|---|
| Model | PCA1500F-24 |
| Item | Instantaneous Interruption Compensation |
| Object | +24V70A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

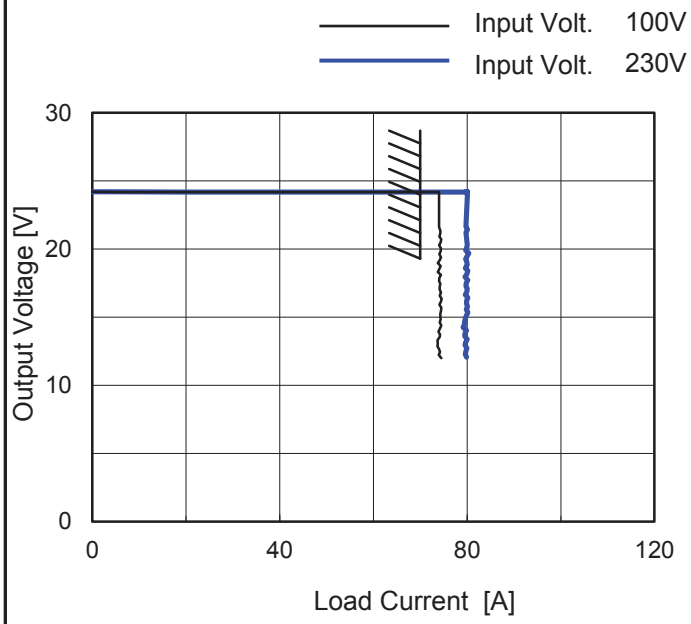
| Load Current [A] | Time [ms] Input Volt. 100[V] | Input Volt. 200[V] | Input Volt. 230[V] |
|---|---|---|---|
| 0.0 | - | - | - |
| 10.0 | 76 | 105 | 106 |
| 20.0 | 45 | 60 | 60 |
| 30.0 | 31 | 41 | 41 |
| 40.0 | 24 | 32 | 32 |
| 50.0 | 20 | 26 | 26 |
| 60.0 | 16 | 21 | 21 |
| 65.0 | 13 | 20 | 20 |
| 70.0 | 13 | 18 | 18 |
| 71.5 | 13 | 18 | 18 |
| 77.0 | - | 17 | 17 |

COSEL

| | |
|---|---|
| Model | PCA1500F-24 |
| Item | Overcurrent Protection |
| Object | +24V70A |

Temperature 25°C
Testing Circuitry Figure A

1.Graph




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

2.Values

| Output Voltage [V] | Load Current [A] | |
|---|---|---|
| | Input Volt. 100[V] | Input Volt. 230[V] |
| 22.8 | 74.00 | 79.77 |
| 21.6 | 74.00 | 79.77 |
| 19.2 | 74.14 | 79.67 |
| 16.8 | 74.40 | 79.92 |
| 14.4 | 74.11 | 79.37 |
| 12.0 | 74.51 | 79.90 |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |
| -- | - | - |

| | | |
|---|---|---|
| Model | PCA1500F-24 | |
| Item | Ambient Temperature Drift | Testing Circuitry Figure A |
| Object | +24V70A | |

1.Values

Load 100%

| Ambient Temperature[℃] | Output Voltage [V] | | |
|---|---|---|---|
| | Input Volt. 100V | Input Volt. 200V | Input Volt. 230V |
| -20 | 24.162 | 24.162 | 24.162 |
| 25 | 24.151 | 24.150 | 24.151 |
| 50 | 24.151 | 24.152 | 24.152 |

| | | |
|---|---|---|
| Item | Minimum Input Voltage for Regulated Output Voltage | Testing Circuitry Figure A |
| Object | +24V70A | |

1.Values

| Ambient Temperature[℃] | Input Voltage [V] | |
|---|---|---|
| | Load 50% | Load 100% |
| -20 | 75 | 85 |
| 25 | 74 | 85 |
| 50 | 75 | 85 |

| | | |
|---|---|---|
| Item | Overvoltage Protection | Testing Circuitry Figure A |
| Object | +24V70A | |

1.Values

Load 0%

| Ambient Temperature[℃] | Operating Point [V] | |
|---|---|---|
| | Input Volt. 100V | Input Volt. 230V |
| -20 | 30.89 | 30.89 |
| 25 | 30.77 | 30.77 |
| 50 | 30.77 | 30.77 |

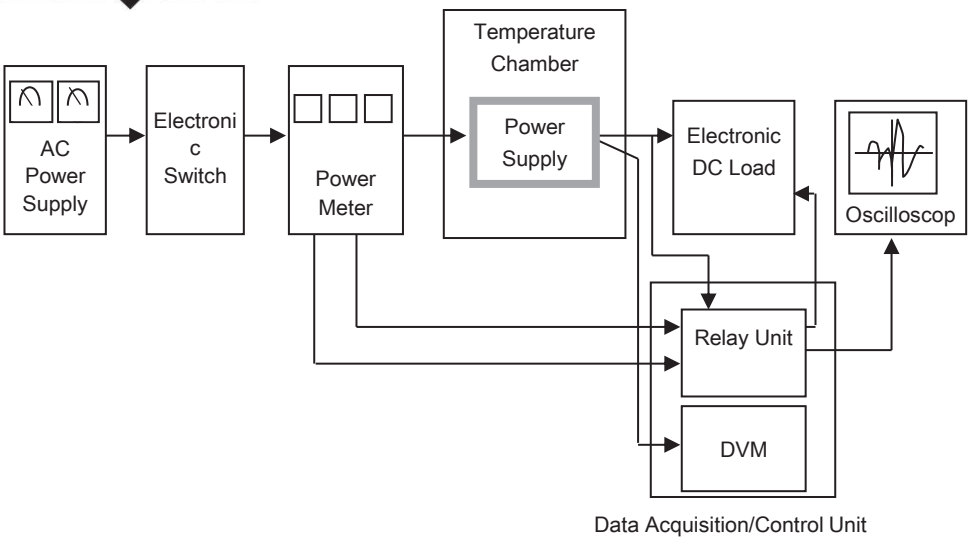



Figure A

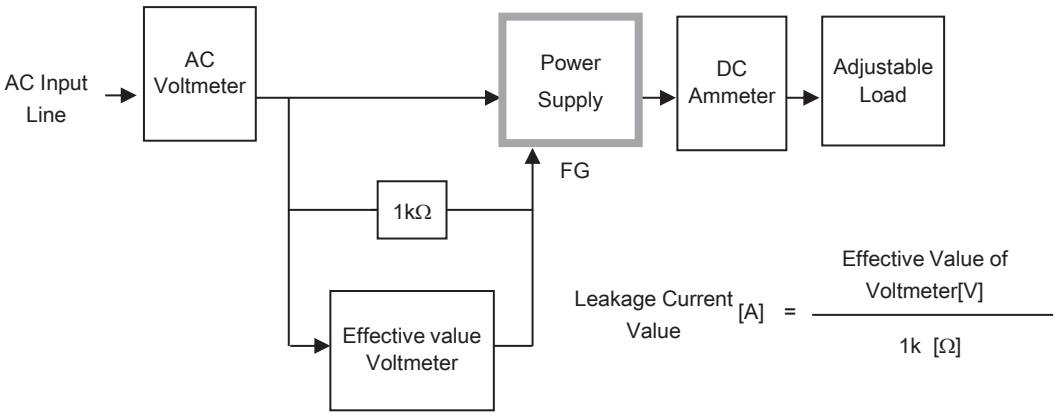



Figure B-1 ( DEN-AN )

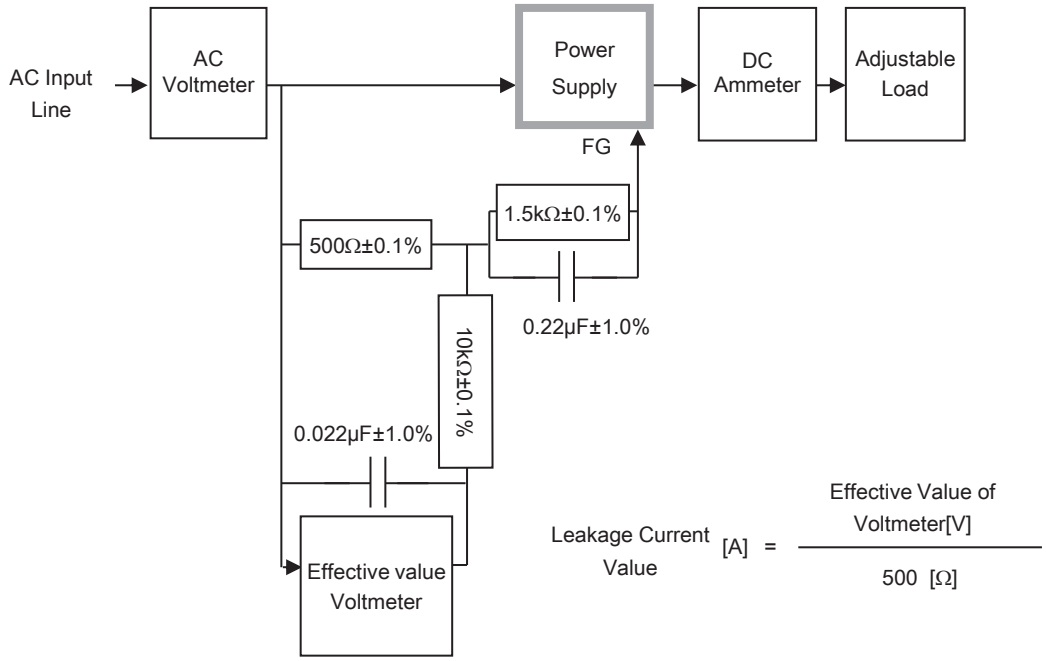



Figure B-2 ( IEC62368-1 refer to IEC60990 Fig.4 )

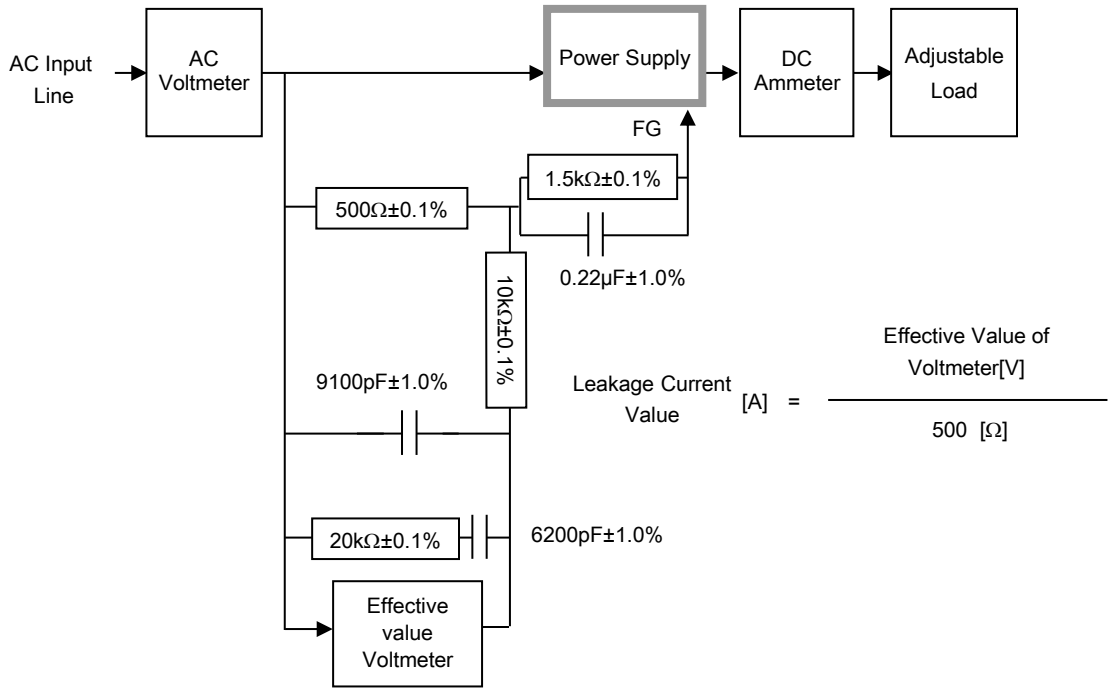



Figure B-3 ( IEC62368-1 refer to IEC60990 Fig.5 )

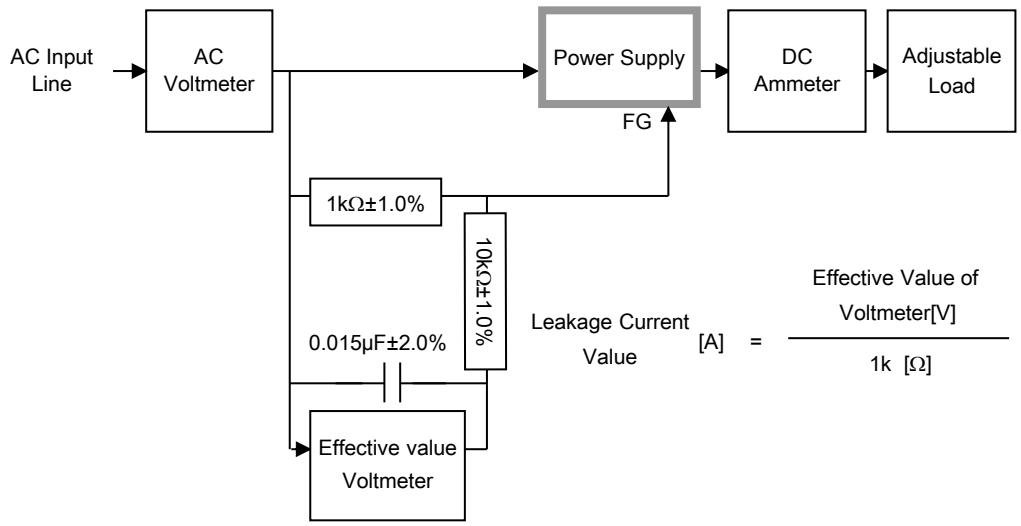



Figure B-4 ( IEC60601-1)

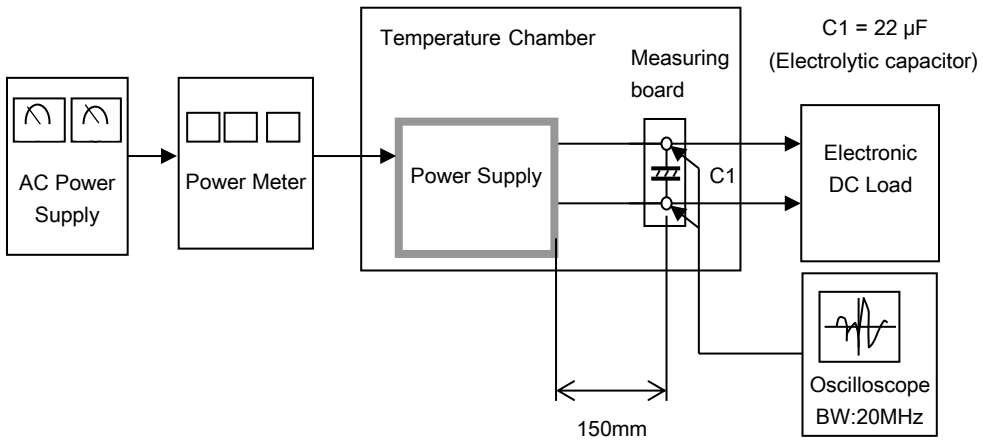



Figure C