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For Reference

TEST DATA OF HCA3500TF-48

Regulated DC Power Supply

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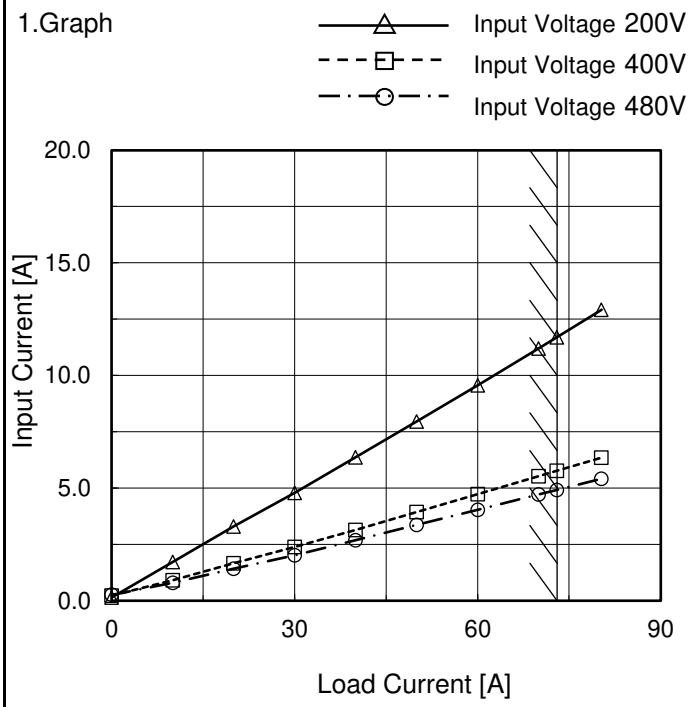
Model	HCA3500TF-48
Item	Input Current (by Load Current)
Object	———————

Ambient Temperature 25°C
Baseplate Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Input Current [A]		
	Input Voltage 200[V]	Input Voltage 400[V]	Input Voltage 480[V]
0.0	0.140	0.228	0.264
10.0	1.710	0.901	0.795
20.0	3.300	1.659	1.414
30.0	4.790	2.379	2.016
40.0	6.370	3.144	2.689
50.0	7.950	3.932	3.364
60.0	9.560	4.731	4.039
70.0	11.200	5.528	4.718
73.0	11.700	5.769	4.921
80.3	12.915	6.350	5.414
-	-	-	-

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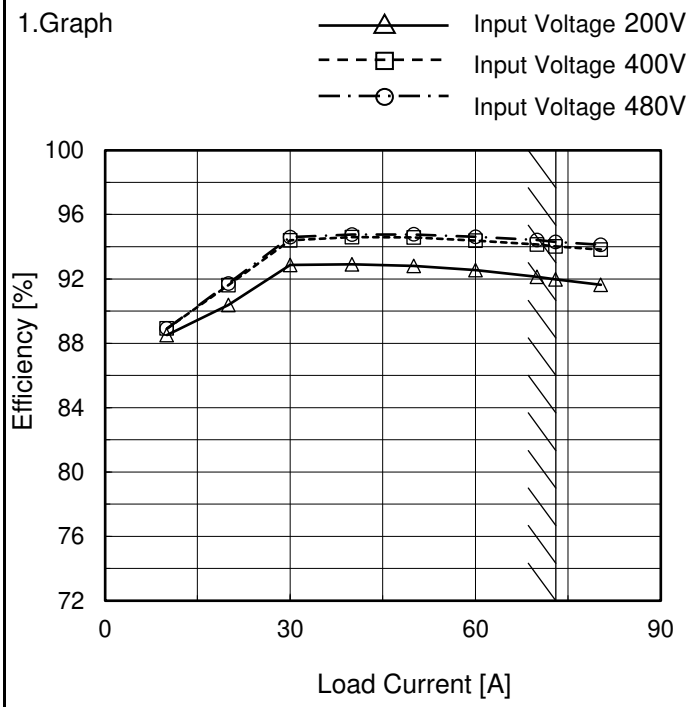
Model	HCA3500TF-48
Item	Efficiency (by Load Current)
Object	————————

Ambient Temperature 25°C
Baseplate Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Efficiency [%]		
	Input Voltage 200[V]	Input Voltage 400[V]	Input Voltage 480[V]
0.0	-	-	-
10.0	88.5	88.9	88.9
20.0	90.4	91.6	91.7
30.0	92.9	94.4	94.6
40.0	92.9	94.6	94.8
50.0	92.8	94.6	94.8
60.0	92.6	94.4	94.6
70.0	92.1	94.1	94.4
73.0	92.0	94.0	94.3
80.3	91.6	93.8	94.1
-	-	-	-

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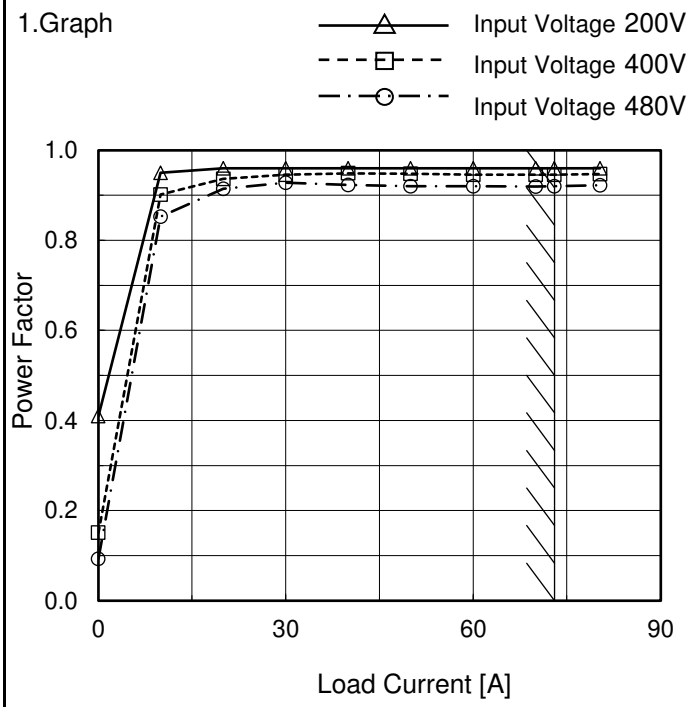
Model	HCA3500TF-48
Item	Power Factor (by Load Current)
Object	————————

Ambient Temperature 25°C
Baseplate Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Power Factor		
	Input Voltage 200[V]	Input Voltage 400[V]	Input Voltage 480[V]
0.0	0.410	0.151	0.093
10.0	0.950	0.902	0.853
20.0	0.960	0.937	0.914
30.0	0.960	0.945	0.928
40.0	0.960	0.949	0.923
50.0	0.960	0.948	0.920
60.0	0.960	0.945	0.920
70.0	0.960	0.945	0.920
73.0	0.960	0.946	0.920
80.3	0.960	0.947	0.922
-	-	-	-

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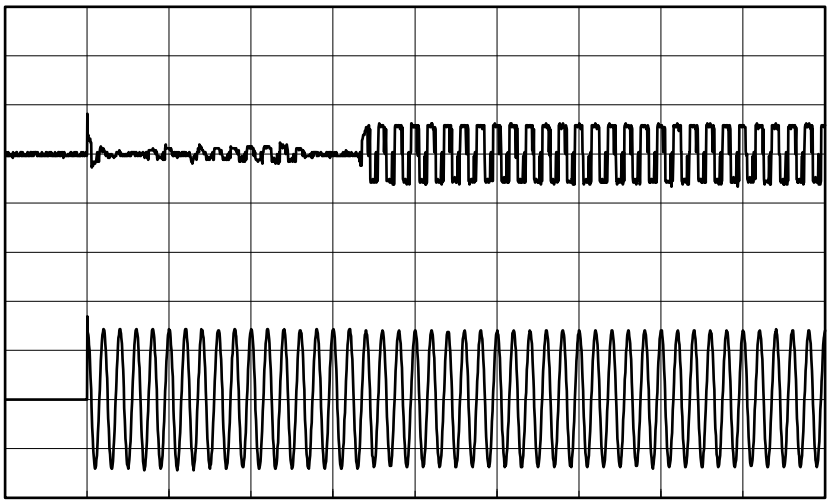
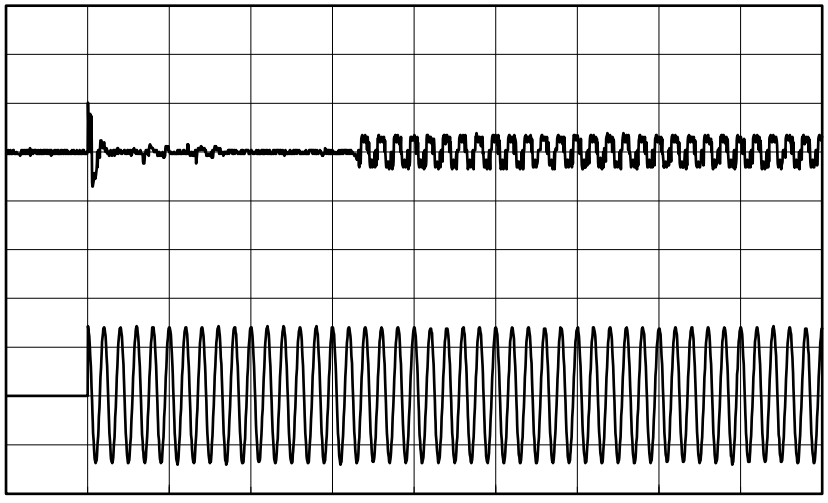
Model	HCA3500TF-48
Item	Inrush Current
Object	————————

Temperature 25°C
Testing Circuitry Figure A



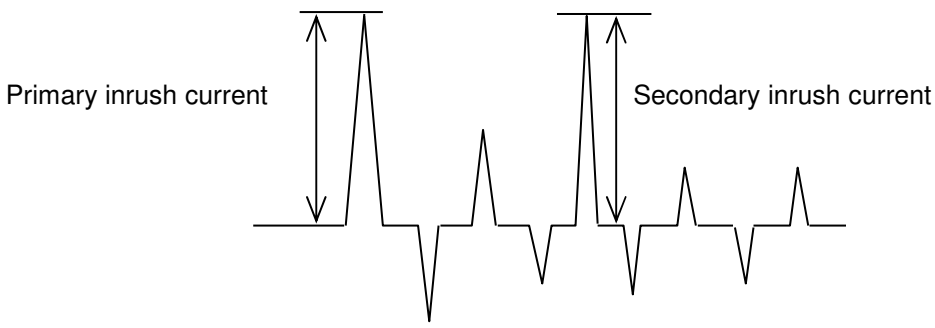
Input Voltage 200 V
Frequency 50 Hz
Load 100 %

Primary inrush current :
17.5 A
Secondary inrush current :
4.2 A



Input Voltage 400 V
Frequency 50 Hz
Load 100 %

Primary inrush current :
23.9 A
Secondary inrush current :
2.4 A



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Model	HCA3500TF-48	Ambient Temperature 25°C Baseplate Temperature 25°C
Item	Leakage Current	Testing Circuitry Figure B
Object	————————	

1.Results

[mA]

Standards	Testing Circuitry	Input Voltage			Note
		200[V]	400[V]	480[V]	
IEC62368-1	FigureB-1	0.58	1.17	1.37	
	FigureB-2	0.58	1.17	1.37	

2.Condition

Leakage current value is concluded after measuring all phases of AC input and by choosing the larger one

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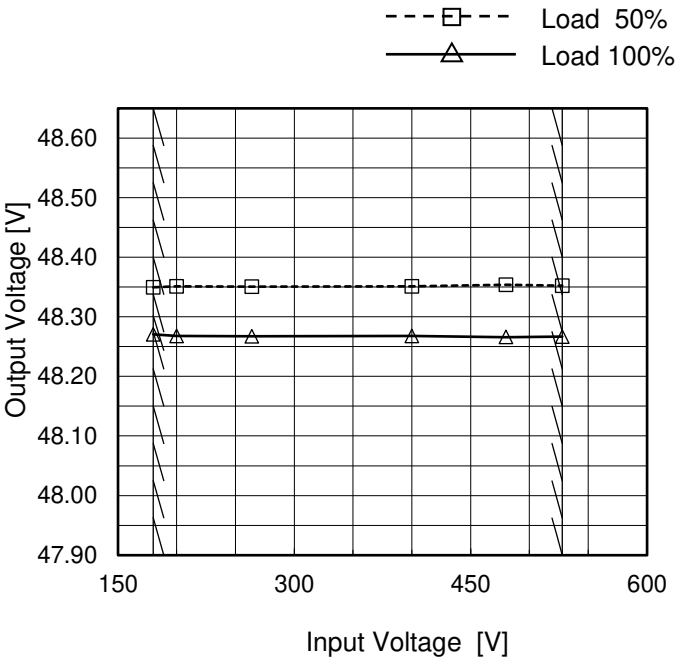
Model	HCA3500TF-48
Item	Line Regulation
Object	+48V73A

Ambient Temperature 25°C
Baseplate Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
180	48.350	48.271
200	48.351	48.268
264	48.351	48.267
400	48.351	48.268
480	48.354	48.266
528	48.352	48.267
-	-	-
-	-	-
-	-	-

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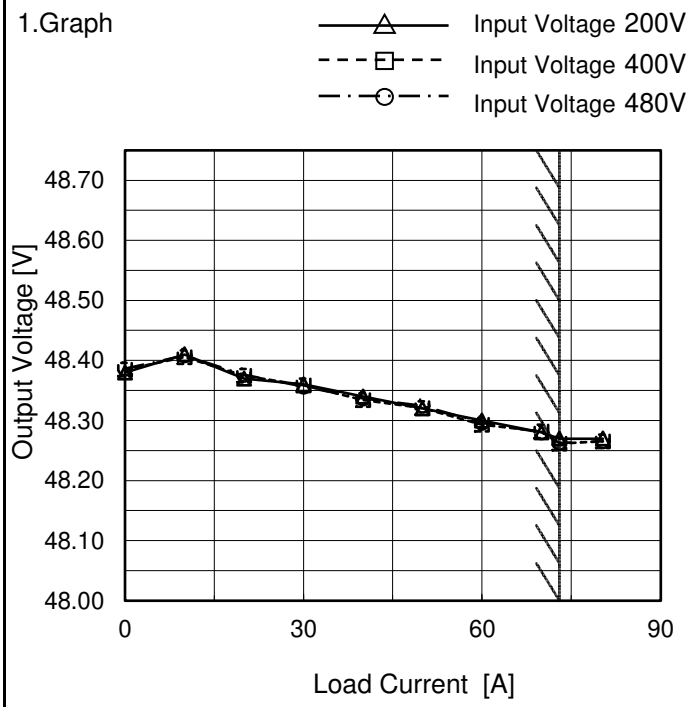
Model	HCA3500TF-48
Item	Load Regulation
Object	+48V73A

Ambient Temperature 25°C
Baseplate Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

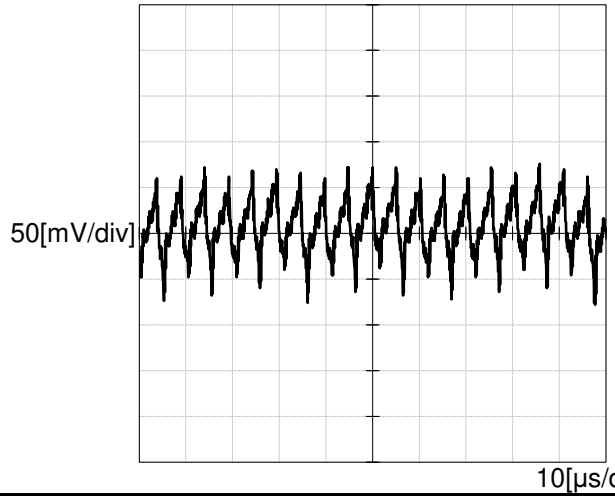
Load Current [A]	Output Voltage [V]		
	Input Voltage 200[V]	Input Voltage 400[V]	Input Voltage 480[V]
0.0	48.380	48.385	48.386
10.0	48.410	48.405	48.408
20.0	48.370	48.374	48.376
30.0	48.360	48.358	48.356
40.0	48.340	48.334	48.337
50.0	48.320	48.321	48.324
60.0	48.300	48.293	48.296
70.0	48.280	48.282	48.280
73.0	48.270	48.262	48.263
80.3	48.270	48.265	48.265
-	-	-	-

Item	Ripple-Noise
Object	+48V73A

Ambient Temperature 25°C
Baseplate Temperature 25°C
Testing Circuitry Figure C

1.Graph

Input Voltage 400V
Load 100%



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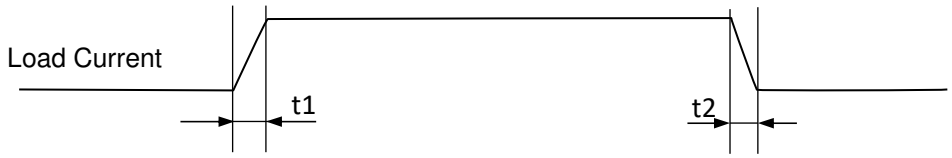
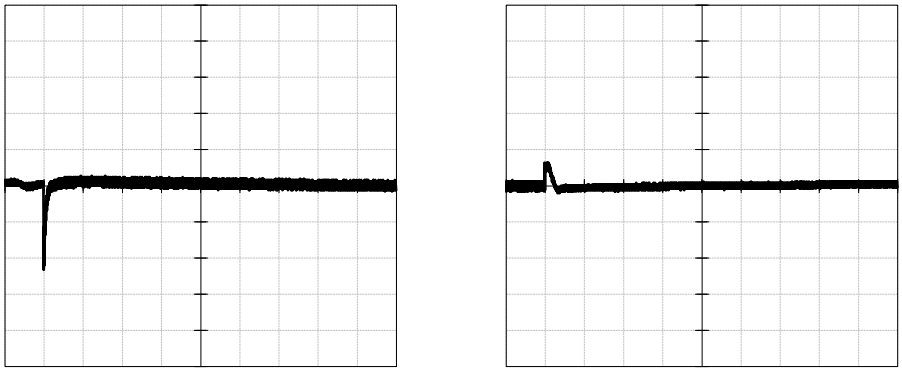
Model	HCA3500TF-48	Ambient Temperature 25°C Baseplate Temperature 25°C
Item	Dynamic Load Response	Testing Circuitry Figure A
Object	+48V73A	

Input Voltage 400 V
Cycle 1000 ms

Response. t1=t2=50µs. Typ



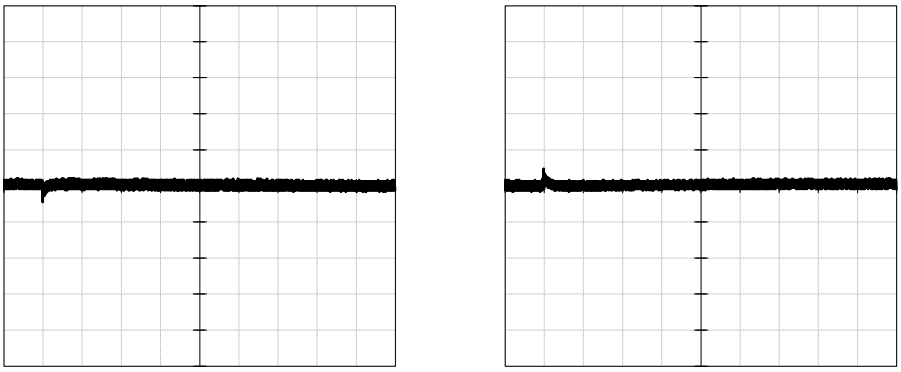
Load 0% ⟷ Load 100%



1[V/div]

10[ms/div] 10[ms/div]

Load 50% ⟷ Load 100%



1[V/div]

10[ms/div] 10[ms/div]

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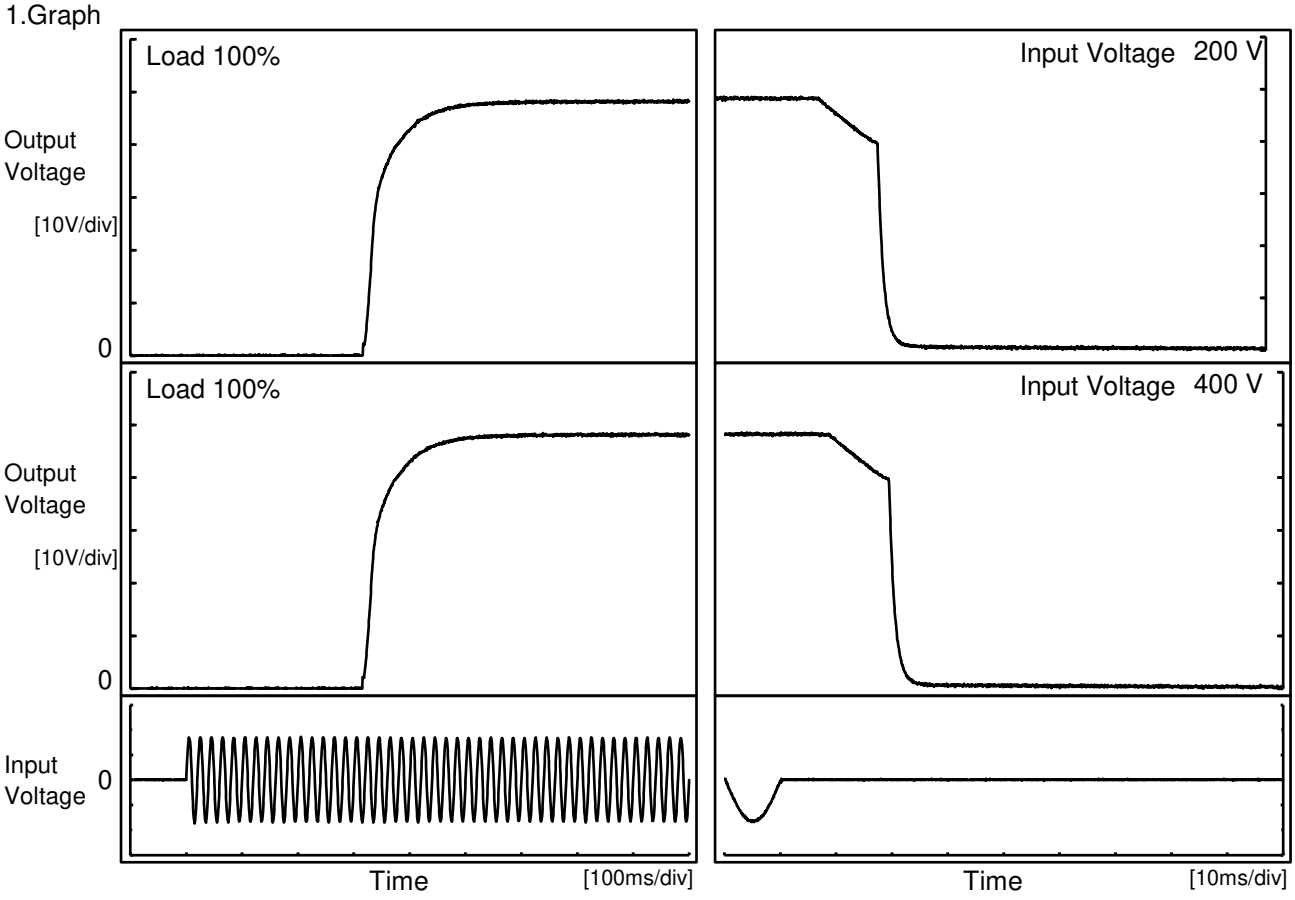
Model	HCA3500TF-48	Ambient Temperature 25°C Baseplate Temperature 25°C Testing Circuitry Figure A
Item	Rise and Fall Time	
Object	+48V73A	

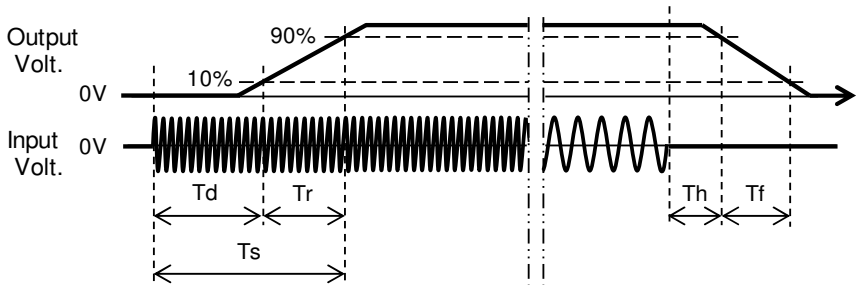
1.Graph



2.Values

[ms]

Input Voltage \ Time	Td	Tr	Ts	Th	Tf
200 V	322.0	82.0	404.0	14.3	7.6
400 V	321.0	81.5	402.5	14.2	7.6



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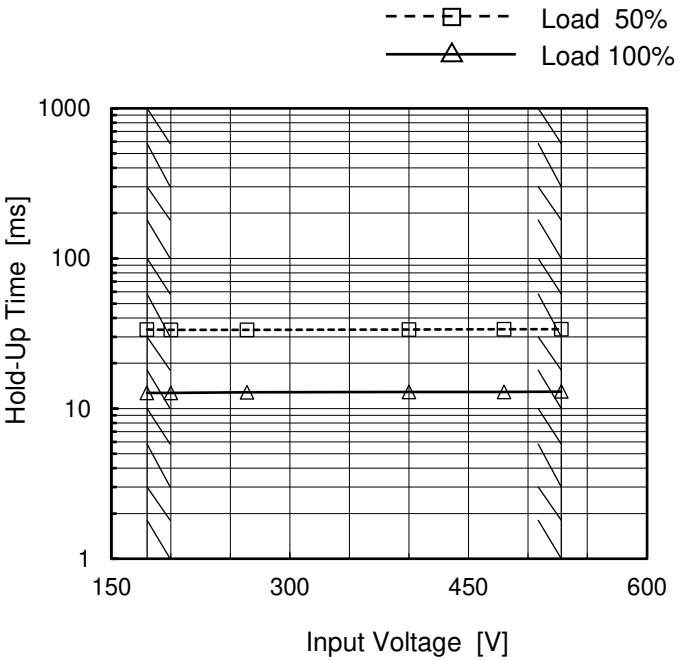
Model	HCA3500TF-48
Item	Hold-Up Time
Object	+48V73A

Ambient Temperature 25°C
Baseplate Temperature 25°C
Testing Circuitry Figure A

1.Graph



This duration covers from Shut-off of input voltage to the moment when output voltage drops to 95% of the rated voltage.

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

2.Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
180	34	13
200	33	13
264	33	13
400	34	13
480	34	13
528	34	13
-	-	-
-	-	-
-	-	-

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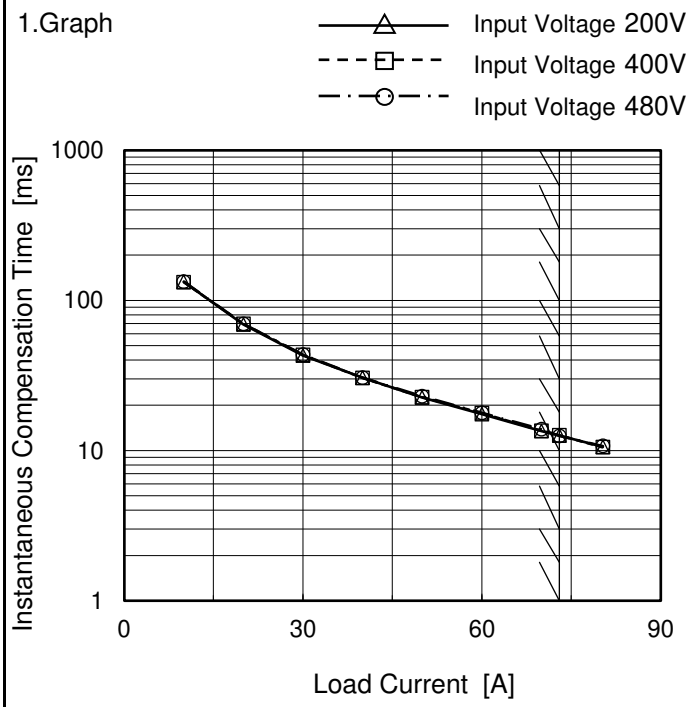
Model	HCA3500TF-48
Item	Instantaneous Interruption Compensation
Object	+48V73A

Ambient Temperature 25°C
Baseplate Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Load Current [A]	Time [ms]		
	Input Voltage 200[V]	Input Voltage 400[V]	Input Voltage 480[V]
0.0	-	-	-
10.0	133	132	134
20.0	69	70	70
30.0	43	43	44
40.0	31	30	31
50.0	23	23	23
60.0	17	18	18
70.0	13	14	14
73.0	13	13	13
80.3	11	11	11
-	-	-	-

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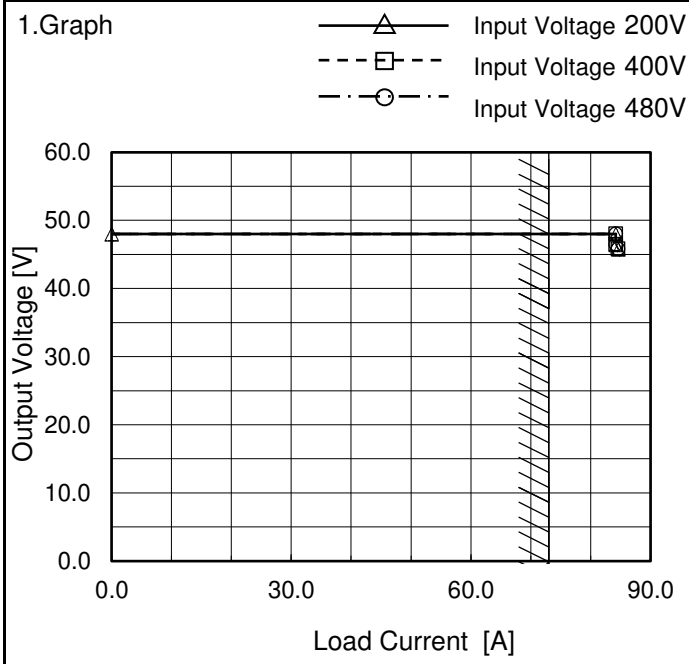
Model	HCA3500TF-48
Item	Overcurrent Protection
Object	+48V73A

Ambient Temperature 25°C
Baseplate Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

Output Voltage [V]	Load Current [A]		
	Input Voltage 200[V]	Input Voltage 400[V]	Input Voltage 480[V]
48.0	84.24	84.24	84.23
46.5	84.24	84.24	84.25
45.8	84.60	84.58	84.59
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

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Model	HCA3500TF-48
Item	Ambient Temperature Drift
Object	+48V73A

Testing Circuitry Figure A

1.Values

Load 100%

Temperature[°C]		Output Voltage [V]		
Ambient	Baseplate	Input Voltage 200V	Input Voltage 400V	Input Voltage 480V
-10	0	48.192	48.225	48.223
25	25	48.338	48.357	48.354
70	55	48.396	48.395	48.389

Item	Minimum Input Voltage for Regulated Output Voltage
Object	+48V73A

Testing Circuitry Figure A

1.Values

Temperature[°C]		Input Voltage [V]	
Ambient	Baseplate	Load 50%	Load 100%
-10	0	171	171
25	25	171	171
70	55	171	171

Item	Overvoltage Protection
Object	+48V73A

Testing Circuitry Figure A

1.Values

Load 0%

Temperature[°C]		Operating Point [V]	
Ambient	Baseplate	Input Voltage 200V	Input Voltage 400V
-10	0	59.91	59.92
25	25	60.03	60.02
70	55	60.86	60.88

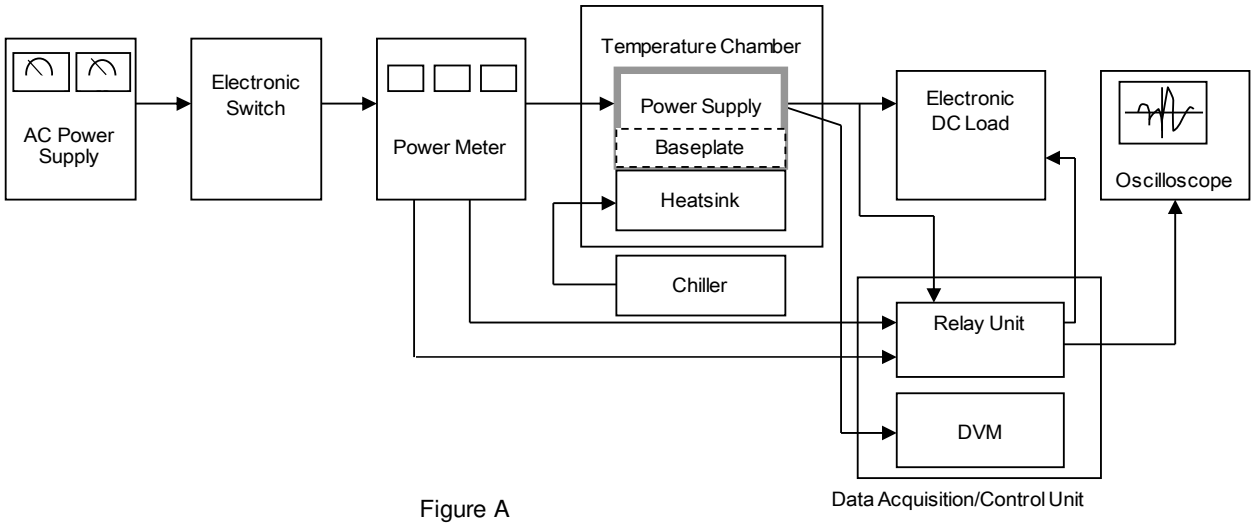

Figure A

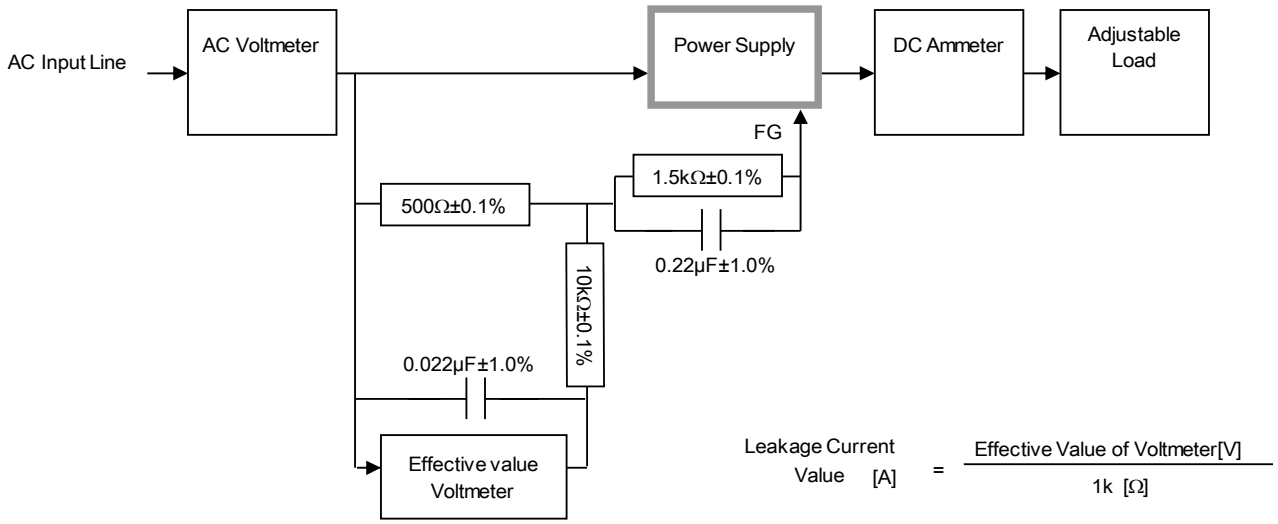

Figure B-1 (IEC62368-1)

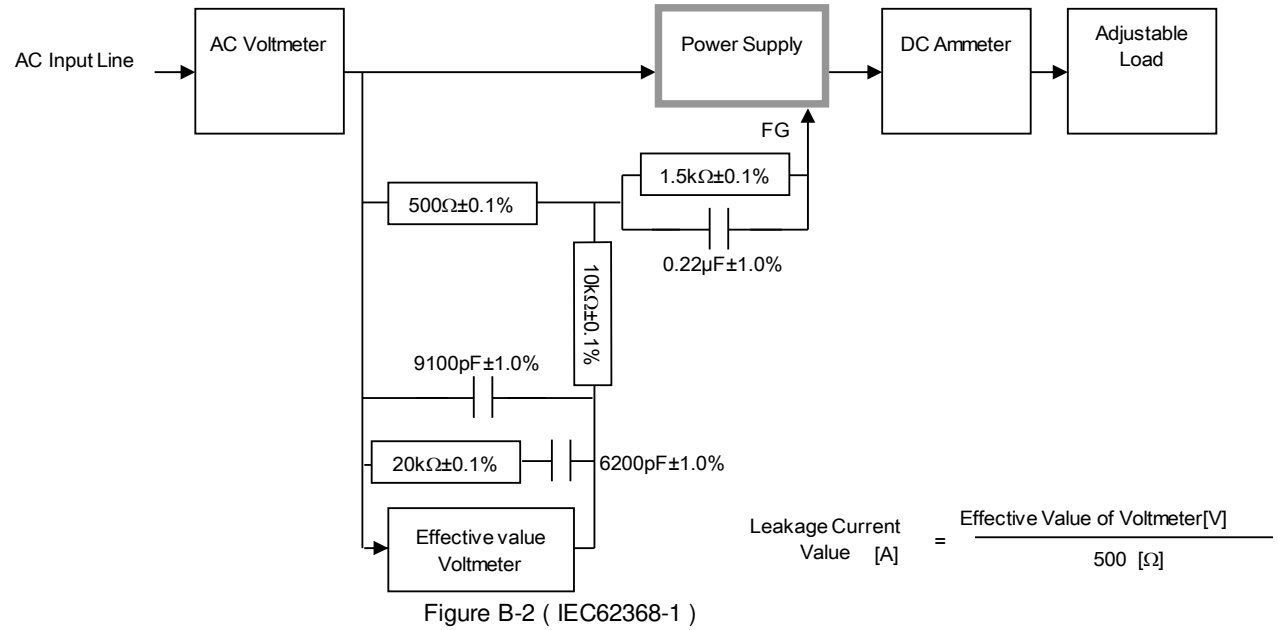

Figure B-2 (IEC62368-1)

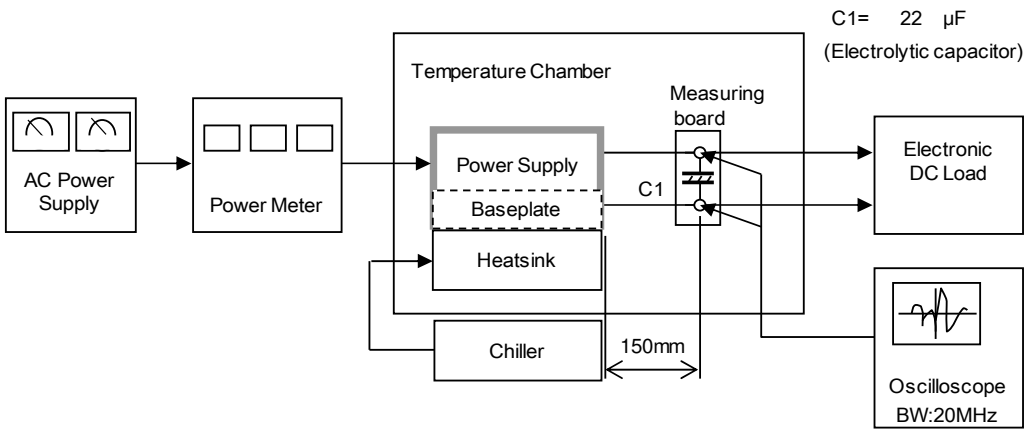
C1= 22 µF
(Electrolytic capacitor)
Temperature Chamber
Measuring board
AC Power Supply
Power Meter
Power Supply
Baseplate
C1
Heatsink
Chiller
150mm
Electronic DC Load
Oscilloscope BW:20MHz

Figure C