COSEL

参考資料

TEST DATA OF GHA500F-30

Regulated DC Power Supply
August 3, 2015

Approved by : Kenji Shiho
Kenji Shiho — Design Manager

Prepared by : Tomoyuki Sakuma
Tomoyuki Sakuma — Design Engineer

COSEL CO.,LTD.

COSEL

CONTENTS

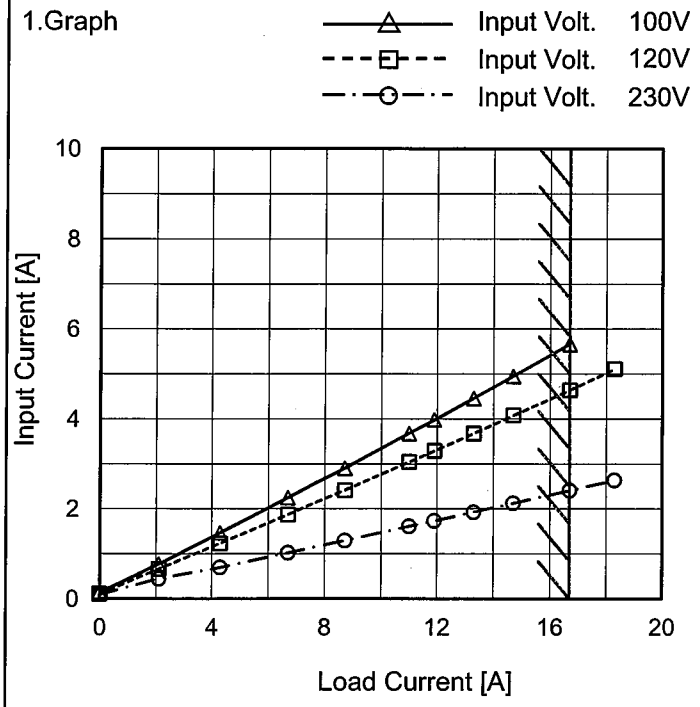
(Final Page 24)

COSEL

Model	GHA500F-30
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. 120[V]	Input Volt. 230[V]
0.0	0.142	0.109	0.091
2.1	0.767	0.659	0.445
4.3	1.468	1.232	0.698
6.7	2.249	1.874	1.025
8.7	2.904	2.412	1.294
11.0	3.676	3.040	1.612
11.9	3.980	3.289	1.735
13.3	4.460	3.679	1.930
14.7	4.950	4.080	2.126
16.7	5.660	4.640	2.408
18.3	-	5.110	2.636

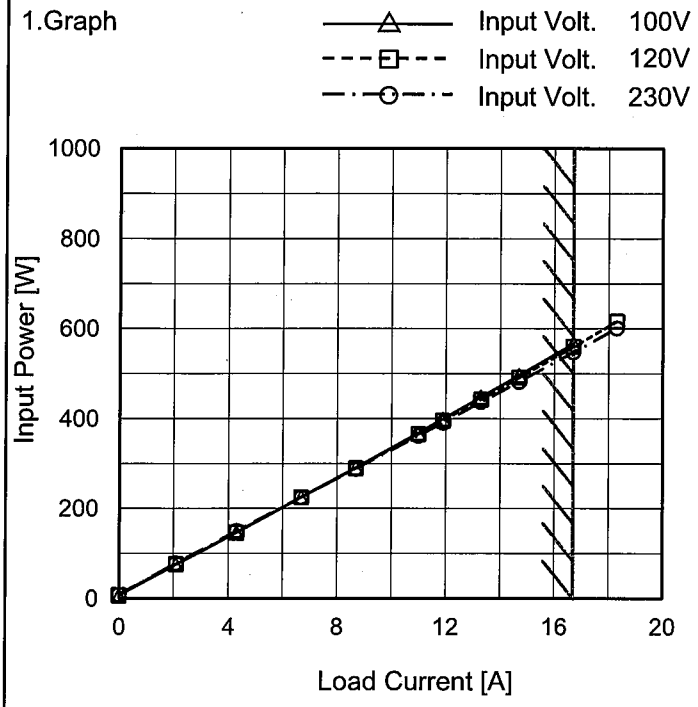
BC-10924

COSEL

Model	GHA500F-30
Item	Input Power (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

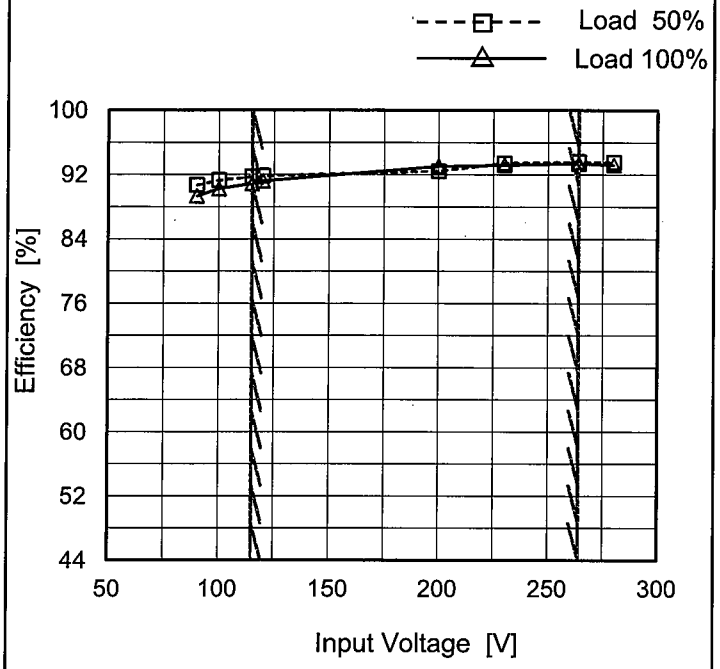
Load Current [A]	Input Power [W]		
	Input Volt. 100[V]	Input Volt. 120[V]	Input Volt. 230[V]
0.0	6.2	7.4	8.3
2.1	75.5	76.4	78.6
4.3	146.2	146.5	149.8
6.7	224.7	224.6	224.9
8.7	290.7	289.6	288.0
11.0	367.8	365.5	362.0
11.9	399.0	395.4	391.0
13.3	448.0	442.5	437.0
14.7	496.0	491.0	482.0
16.7	567.0	560.0	548.0
18.3	-	616.0	601.0

COSEL

Model	GHA500F-30
Item	Efficiency (by Input Voltage)
Object	――――――――――

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]	Efficiency [%]	
	Load 50%	Load 100%
90	90.7	89.4 ※1
100	91.3	90.3 ※2
115	91.8	90.9
120	91.9	91.2
200	92.4	93.1
230	93.4	93.2
264	93.6	93.4
280	93.5	93.2
--	-	-

※1 : Load 80%
※2 : Load 88%

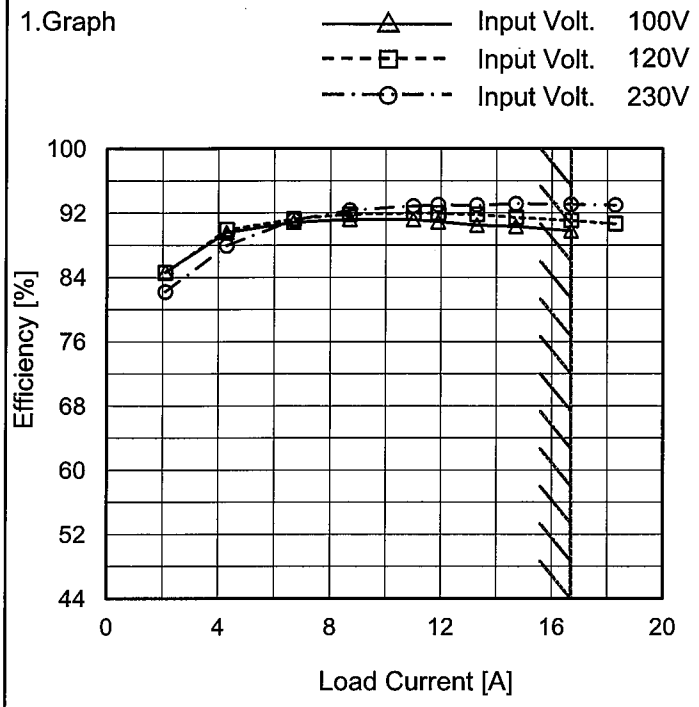
BC-10924

COSEL

Model	GHA500F-30
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. 120[V]	Input Volt. 230[V]
0.0	-	-	-
2.1	84.7	84.6	82.2
4.3	89.6	89.9	87.9
6.7	90.9	91.3	91.1
8.7	91.2	91.8	92.4
11.0	91.2	92.0	92.9
11.9	90.9	92.0	93.0
13.3	90.5	91.8	93.0
14.7	90.4	91.5	93.2
16.7	89.8	91.1	93.1
18.3	-	90.7	93.0

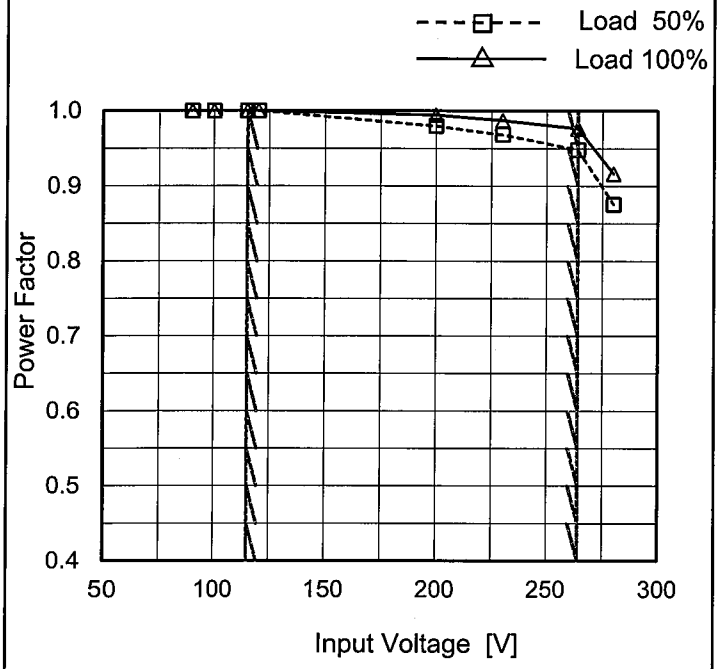
BC-10924

COSEL

Model	GHA500F-30
Item	Power Factor (by Input Voltage)
Object	――――――――――

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]	Power Factor	
	Load 50%	Load 100%
90	0.999	0.999 ※1
100	0.999	0.999 ※2
115	0.999	0.999
120	0.999	0.999
200	0.980	0.995
230	0.968	0.987
264	0.948	0.977
280	0.876	0.916
--	-	-

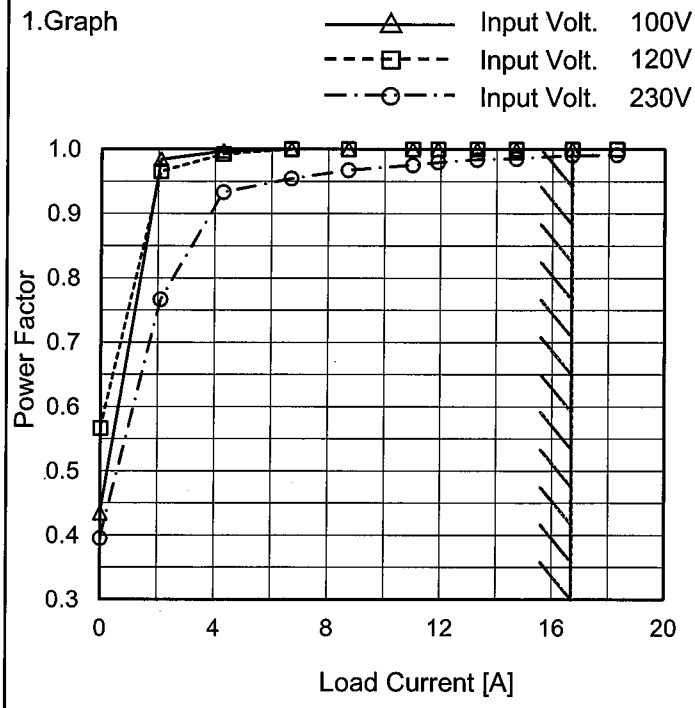
※1 : Load 80%
※2 : Load 88%

COSEL

Model	GHA500F-30
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.

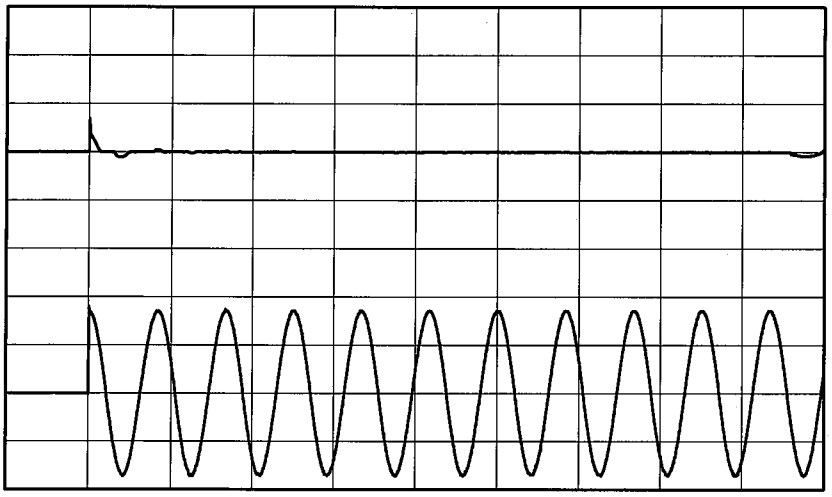
2.Values

Load Current [A]	Power Factor		
	Input Volt. 100[V]	Input Volt. 120[V]	Input Volt. 230[V]
0.0	0.435	0.566	0.395
2.1	0.984	0.966	0.767
4.3	0.997	0.993	0.933
6.7	0.999	0.999	0.955
8.7	0.999	0.999	0.968
11.0	0.999	0.999	0.976
11.9	0.999	0.999	0.980
13.3	0.999	0.999	0.984
14.7	0.999	0.999	0.986
16.7	0.999	0.999	0.991
18.3	-	0.999	0.992

COSEL

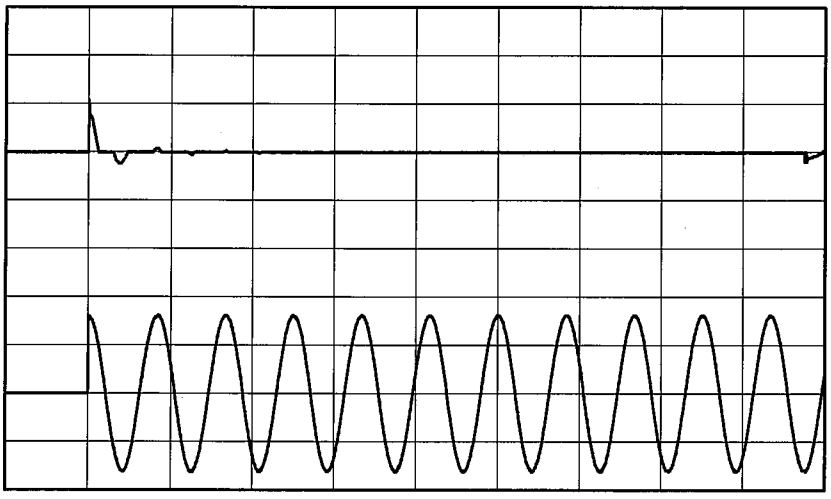
Model	GHA500F-30
Item	Inrush Current
Object	————————

Temperature 25°C
Testing Circuitry Figure A



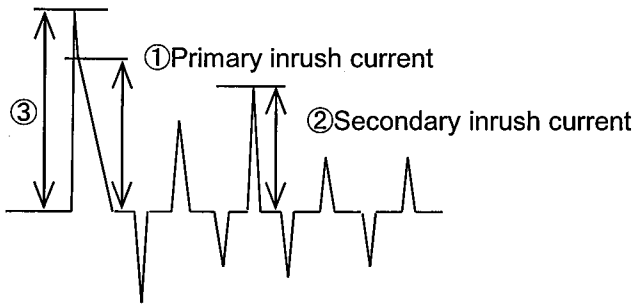
Input Voltage 120 V
Frequency 60 Hz
Load 100 %

①Primary inrush current :
18.0A
②Secondary inrush current :
4.1A
③Surge current ※1:
34.3A



Input Voltage 230 V
Frequency 60 Hz
Load 100 %

①Primary inrush current :
37.6 A
②Secondary inrush current :
10.0A
③Surge current ※1:
54.0A



※1 The specification of the primary inrush current means that the surge current to a built-in noise filter (0.2msec or less : waveform ③) is excluded.

BC-10924

COSEL

Model	GHA500F-30	
Item	Leakage Current	Temperature 25°C Testing Circuitry Figure B
Object	———————————	

1.Results

[mA]

Standards		Input Volt.			Note
		100 [V]	120 [V]	240 [V]	
IEC60601	Both phases	0.08	0.09	0.17	Operation
	One of phases	0.14	0.15	0.31	Stand by

The value for "One of phases" is the reference value only.

2.Condition

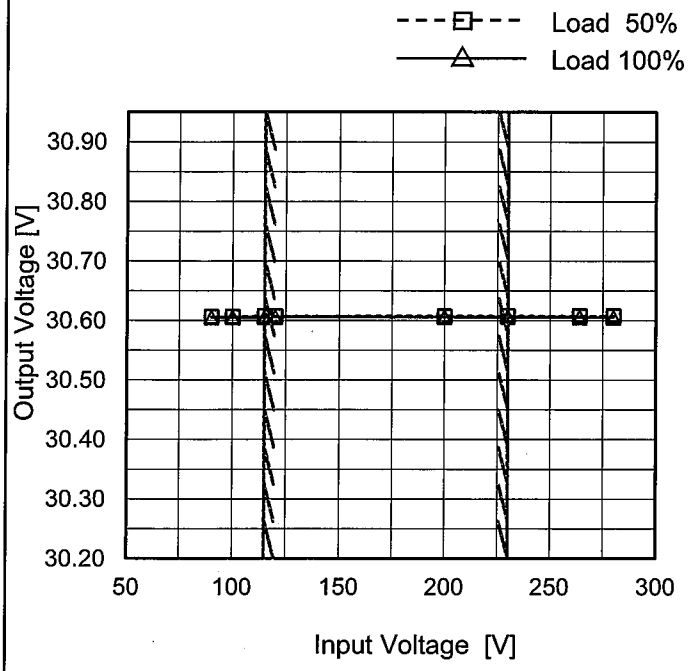
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

COSEL

Model	GHA500F-30
Item	Line Regulation
Object	+30V16.7A

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%
90	30.606	30.605 ※1
100	30.606	30.605 ※2
115	30.607	30.606
120	30.607	30.606
200	30.607	30.606
230	30.608	30.606
264	30.608	30.606
280	30.608	30.605
--	-	-

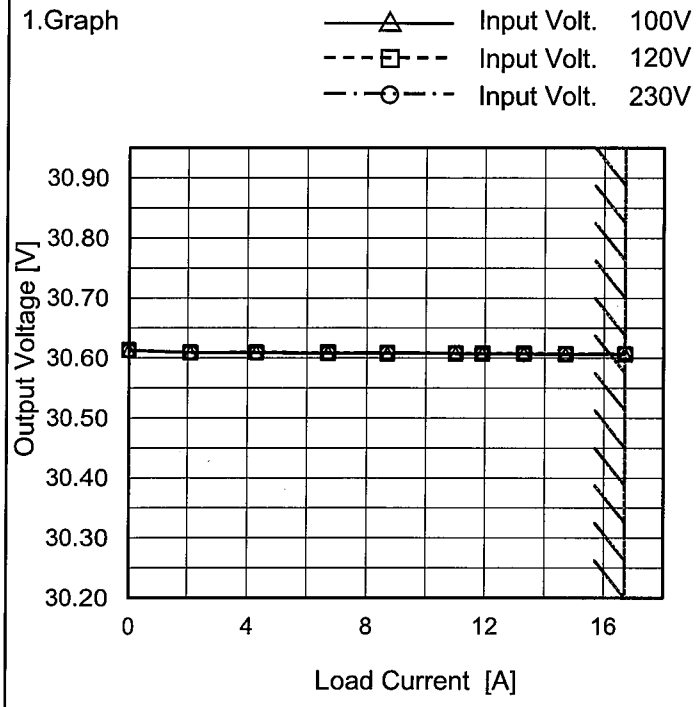
※1 : Load 80%
※2 : Load 88%

COSEL

Model	GHA500F-30
Item	Load Regulation
Object	+30V16.7A

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. 120[V]	Input Volt. 230[V]
0.0	30.613	30.614	30.612
2.1	30.609	30.609	30.610
4.3	30.609	30.610	30.609
6.7	30.608	30.609	30.608
8.7	30.607	30.609	30.609
11.0	30.608	30.608	30.608
11.9	30.607	30.608	30.607
13.3	30.607	30.608	30.607
14.7	30.606	30.607	30.607
16.7	30.606	30.607	30.607
--	-	-	-

BC-10924

COSEL

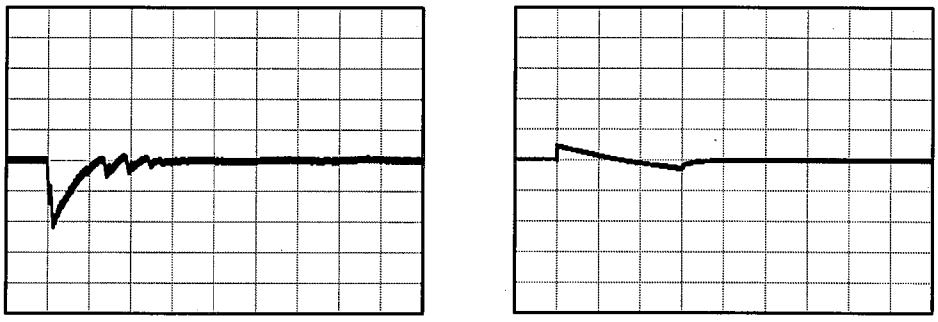
Model	GHA500F-30		
Item	Dynamic Load Response	Temperature Testing Circuitry	25℃ Figure A
Object	+30V 16.7A		

Input Volt. 120V
Cycle 1000ms

Load Current

16.7A / 50us

Min.Load (0A)⟷
Load 100%(16.7A)

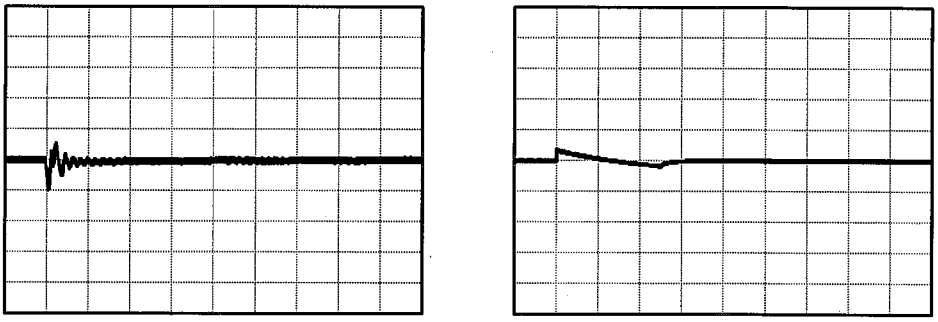


1 V/div

4 ms/div

40 ms/div

Min.Load (0A)⟷
Load 50%(8.35A)

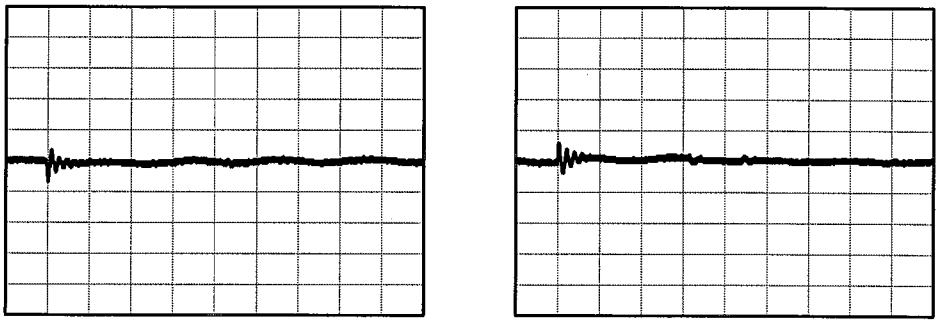


1 V/div

4 ms/div

40 ms/div

Load 50% (8.35A)⟷
Load 100% (16.7A)



500 mV/div

4 ms/div

4 ms/div

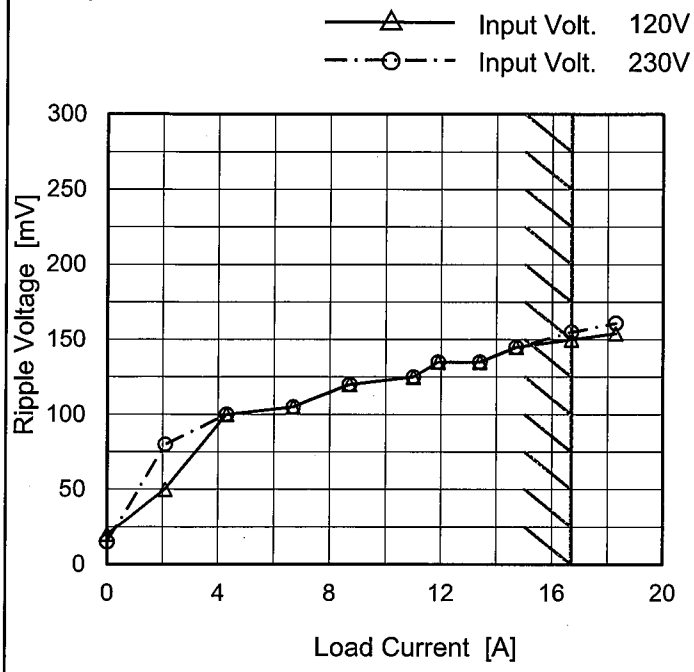
Note : With recommended external capacitor 3300 μF

COSEL

Model	GHA500F-30
Item	Ripple Voltage (by Load Current)
Object	+30V16.7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Measured by 20 MHz Oscilloscope.
Ripple Voltage is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

Ripple [mVp-p]

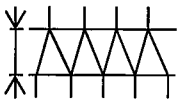


Fig.Complex Ripple Wave

2.Values

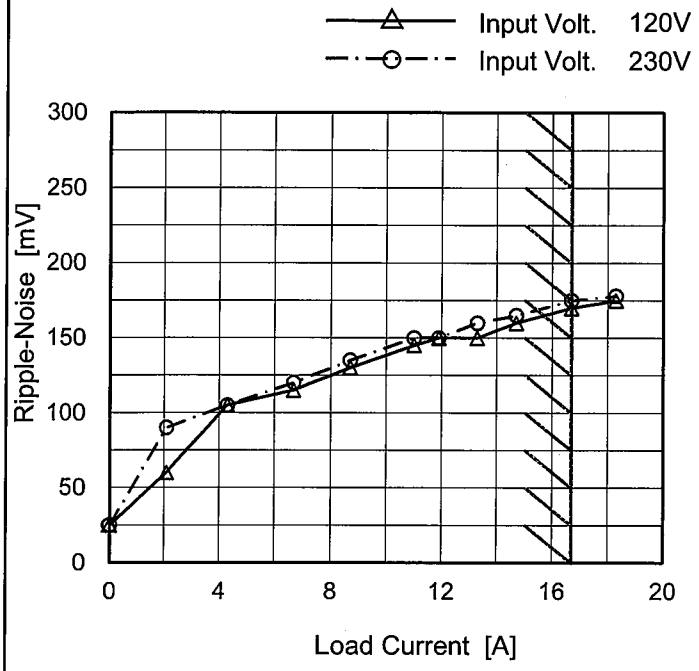
Load Current [A]	Ripple Voltage [mV]	
	Input Volt. 120 [V]	Input Volt. 230 [V]
0.0	20	15
2.1	50	80
4.3	100	100
6.7	105	105
8.7	120	120
11.0	125	125
11.9	135	135
13.4	135	135
14.7	145	145
16.7	150	155
18.3	155	160

COSEL

Model	GHA500F-30
Item	Ripple-Noise
Object	+30V16.7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Measured by 20 MHz Oscilloscope.
Ripple-Noise is shown as p-p in the figure below.
Note: Slanted line shows the range of the rated load current.

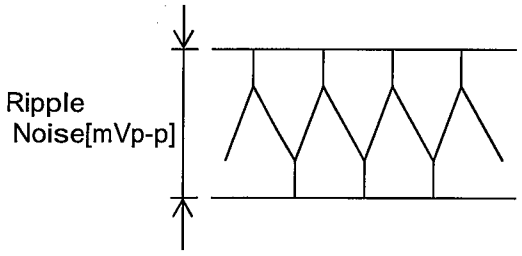


Fig.Complex Ripple Noise Wave Form

2.Values

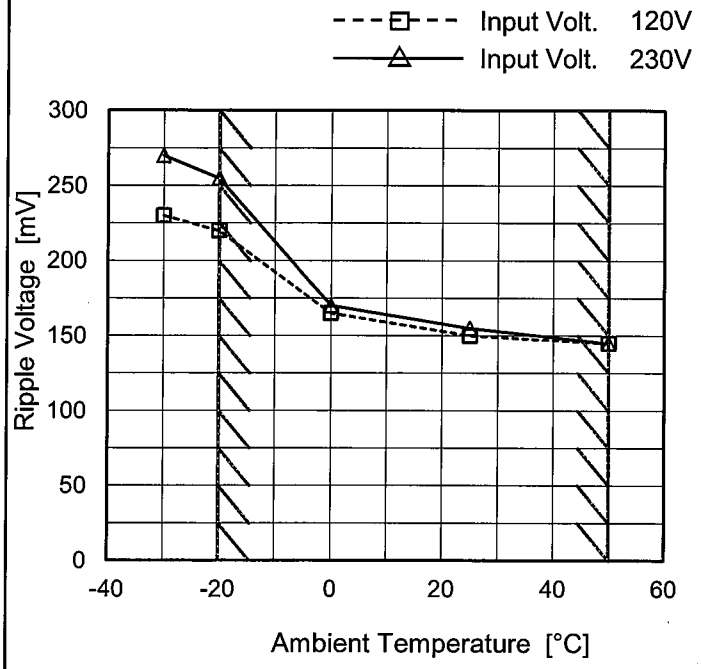
Load Current [A]	Ripple-Noise [mV]	
	Input Volt. 120 [V]	Input Volt. 230 [V]
0.0	25	25
2.1	60	90
4.3	105	105
6.7	115	120
8.7	130	135
11.0	145	150
11.9	150	150
13.3	150	160
14.7	160	165
16.7	170	175
18.3	175	180

COSEL

Model	GHA500F-30
Item	Ripple Voltage (by Ambient Temp.)
Object	+30V16.7A

Testing Circuitry Figure A

1.Graph



Measured by 20 MHz Oscilloscope.

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

2.Values

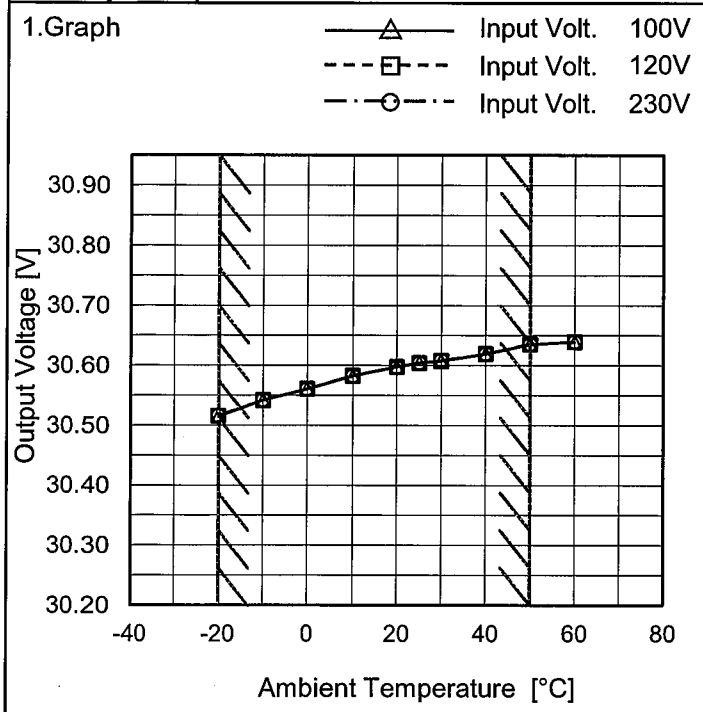
Ambient Temperature [°C]	Ripple Voltage [mV]	
	Input Volt. 120 [V]	Input Volt. 230 [V]
-30	230	270
-20	220	255
0	165	170
25	150	155
50	145	145
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-
--	-	-

COSEL

Model	GHA500F-30
Item	Ambient Temperature Drift
Object	+30V16.7A

Testing Circuitry Figure A

1.Graph



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

2.Values

Ambient Temperature [°C]	Output Voltage [V]		
	Input Volt. 100[V]	Input Volt. 120[V]	Input Volt. 230[V]
-20	30.515	30.516	30.516
-10	30.542	30.542	30.542
0	30.561	30.561	30.561
10	30.582	30.583	30.583
20	30.598	30.598	30.597
25	30.604	30.604	30.605
30	30.608	30.608	30.608
40	30.619	30.619	30.620
50	30.636	30.635	30.636
60	30.639	30.640	30.640
--	-	-	-

Note: In case of Input Volt. 100V, Load 88%.
Other case Load 100%.

COSEL

Model	GHA500F-30	
Item	Output Voltage Accuracy	Testing Circuitry Figure A
Object	+30V16.7A	

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 - 16.7A

* Output Voltage Accuracy = ±(Maximum of Output Voltage - Minimum of Output Voltage) / 2

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

2.Values

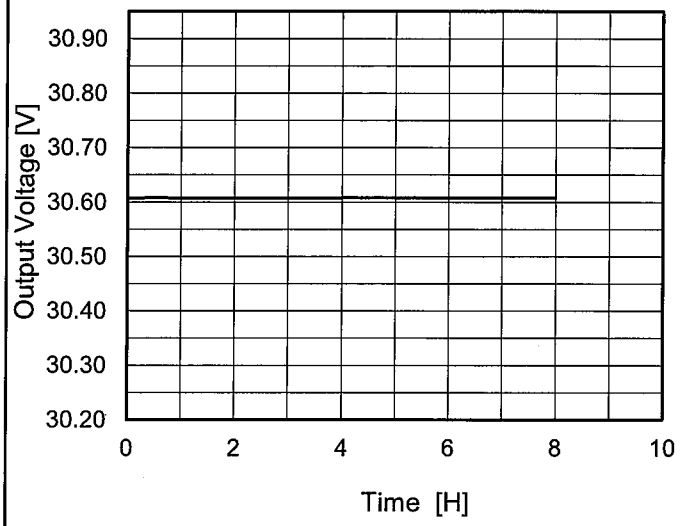
Item	Temperature [°C]	Input Voltage[V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ratio [%]
Maximum Voltage	50	120	0	30.638	±65	±0.2
Minimum Voltage	-20	115	16.7	30.508		

COSEL

Model	GHA500F-30
Item	Time Lapse Drift
Object	+30V16.7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



Input Volt. 230V
Load 100%

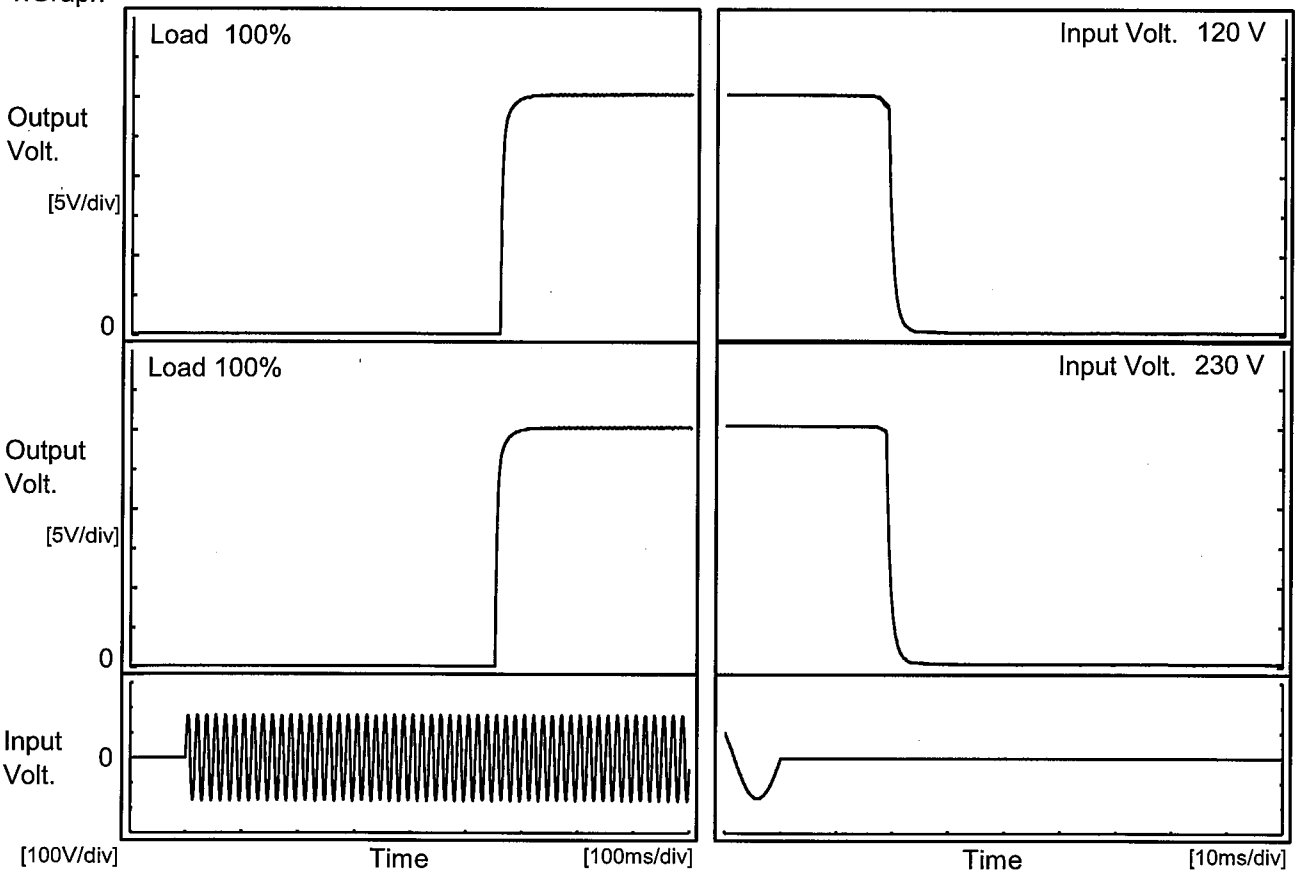
2.Values

Time since start [H]	Output Voltage [V]
0.0	30.607
0.5	30.609
1.0	30.607
2.0	30.608
3.0	30.608
4.0	30.608
5.0	30.608
6.0	30.608
7.0	30.608
8.0	30.608

COSEL

Model	GHA500F-30	
Item	Rise and Fall Time	Temperature 25°C Testing Circuitry Figure A
Object	+30V16.7A	

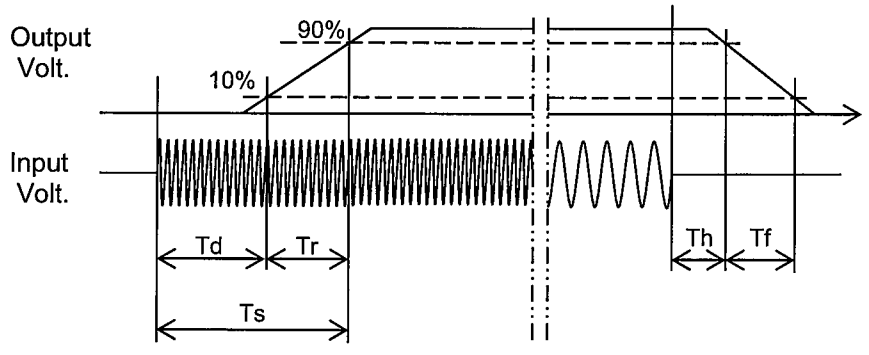
1.Graph



2.Values

[ms]

Input Volt. \ Time	Td	Tr	Ts	Th	Tf
120V	542.5	10.5	553.0	19.1	1.9
230V	551.5	10.5	562.0	19.0	1.9

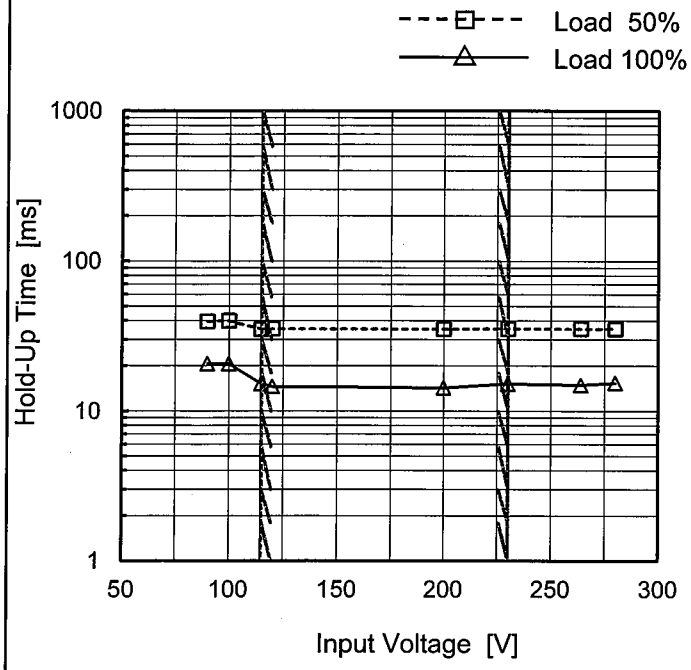


COSEL

Model	GHA500F-30
Item	Hold-Up Time
Object	+30V16.7A

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%
90	40	21 ※1
100	40	21 ※2
115	35	15
120	35	15
200	35	14
230	35	15
264	35	15
280	35	15
--	-	-

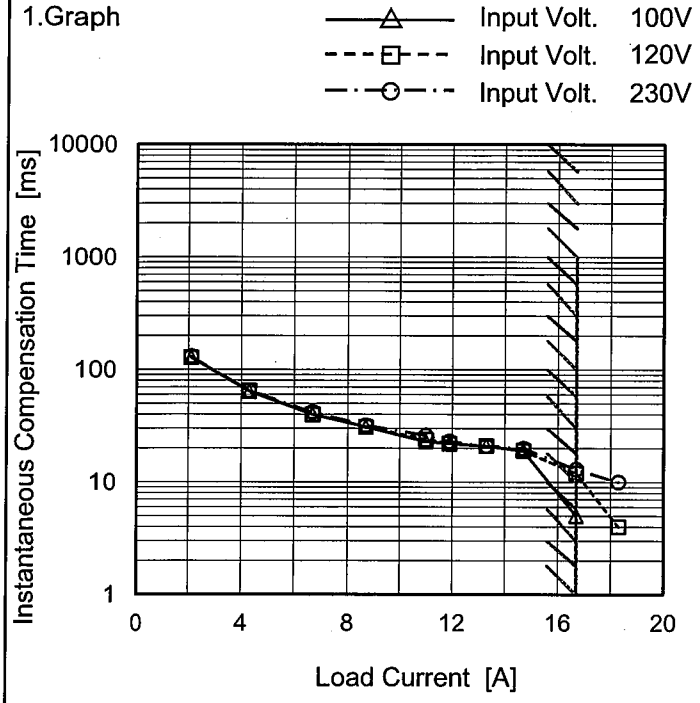
※1 : Load 80%
※2 : Load 88%

COSEL

Model	GHA500F-30
Item	Instantaneous Interruption Compensation
Object	+30V16.7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

2.Values

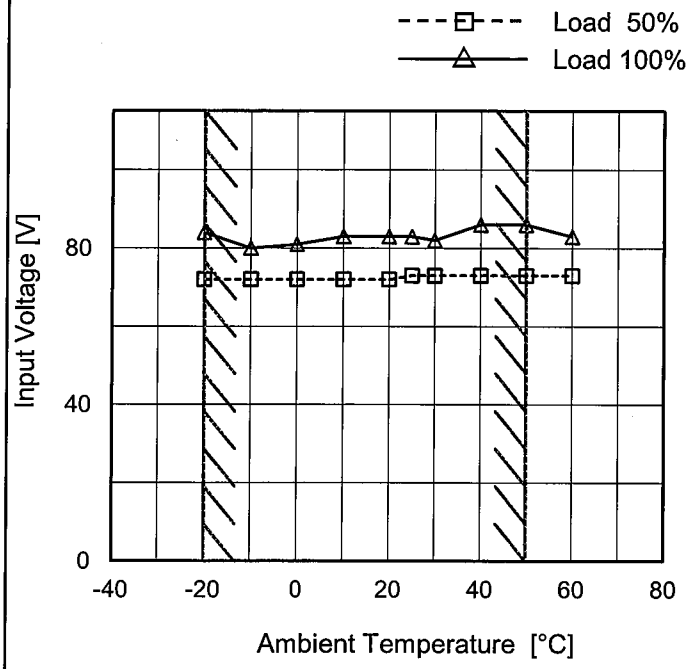
Load Current [A]	Time [ms]		
	Input Volt. 100[V]	Input Volt. 120[V]	Input Volt. 230[V]
0.0	-	-	-
2.1	128	128	131
4.3	64	65	65
6.7	40	40	42
8.7	31	31	32
11.0	23	24	26
11.9	22	22	23
13.3	21	21	21
14.7	19	19	20
16.7	5	12	13
18.3	-	4	10

COSEL

Model	GHA500F-30
Item	Minimum Input Voltage for Regulated Output Voltage
Object	+30V16.7A

Testing Circuitry Figure A

1.Graph



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

2.Values

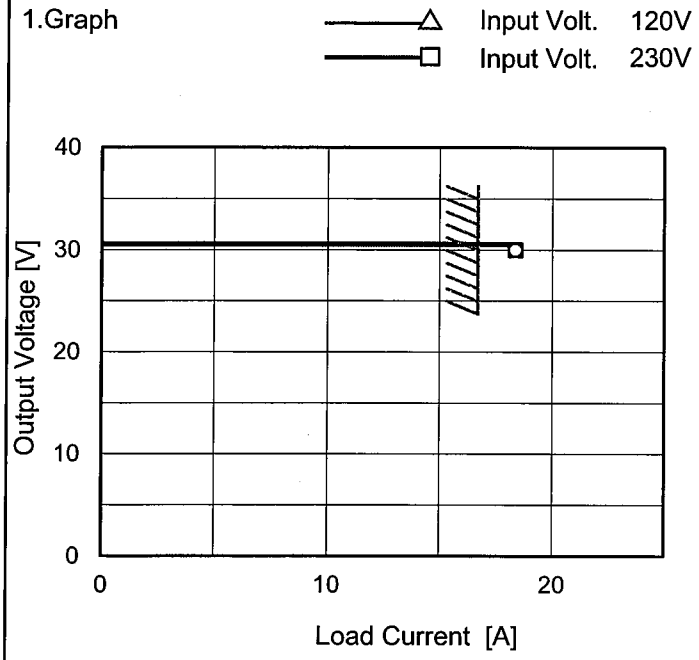
Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-20	72	84
-10	72	80
0	72	81
10	72	83
20	72	83
25	73	83
30	73	82
40	73	86
50	73	86
60	73	83
--	-	-

COSEL

Model	GHA500F-30
Item	Overcurrent Protection
Object	+30V16.7A

Temperature 25°C
Testing Circuitry Figure A

1.Graph



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

Intermittent operation occurs when overcurrent protection is activated.

2.Values

Output Voltage [V]	Load Current [A]	
	Input Volt. 120[V]	Input Volt. 230[V]
30.0	18.36	18.36
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

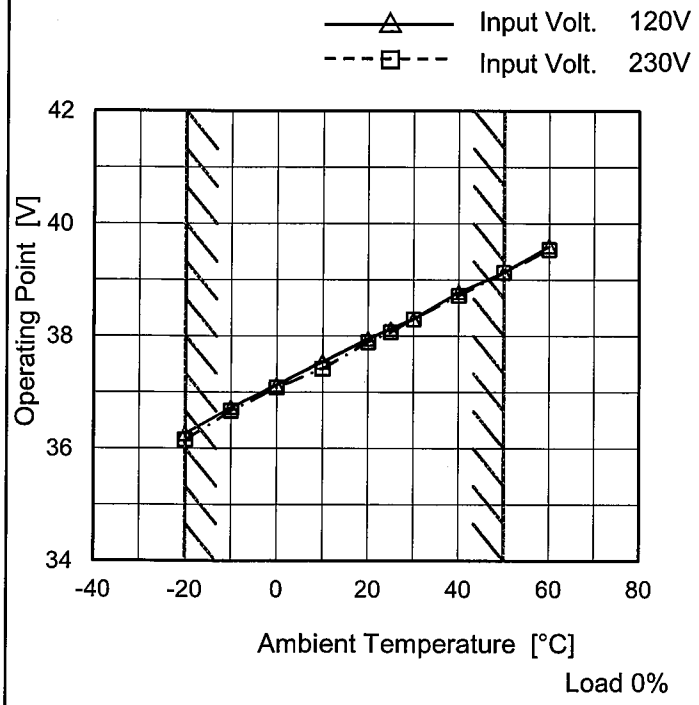
BC-10924

COSEL

Model	GHA500F-30
Item	Overvoltage Protection
Object	+30V16.7A

Testing Circuitry Figure A

1.Graph



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

2.Values

Ambient Temperature [°C]	Operating Point [V]	
	Input Volt. 120[V]	Input Volt. 230[V]
-20	36.20	36.15
-10	36.73	36.67
0	37.08	37.08
10	37.43	37.42
20	37.89	37.89
25	38.13	38.07
30	38.30	38.30
40	38.72	38.72
50	39.13	39.13
60	39.54	39.54
--	-	-

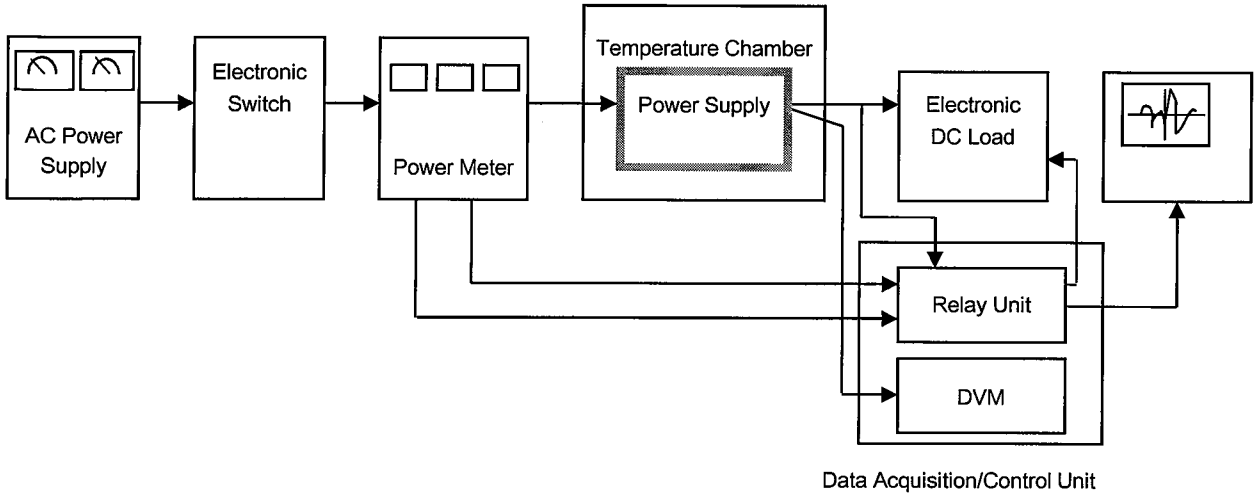


Figure A

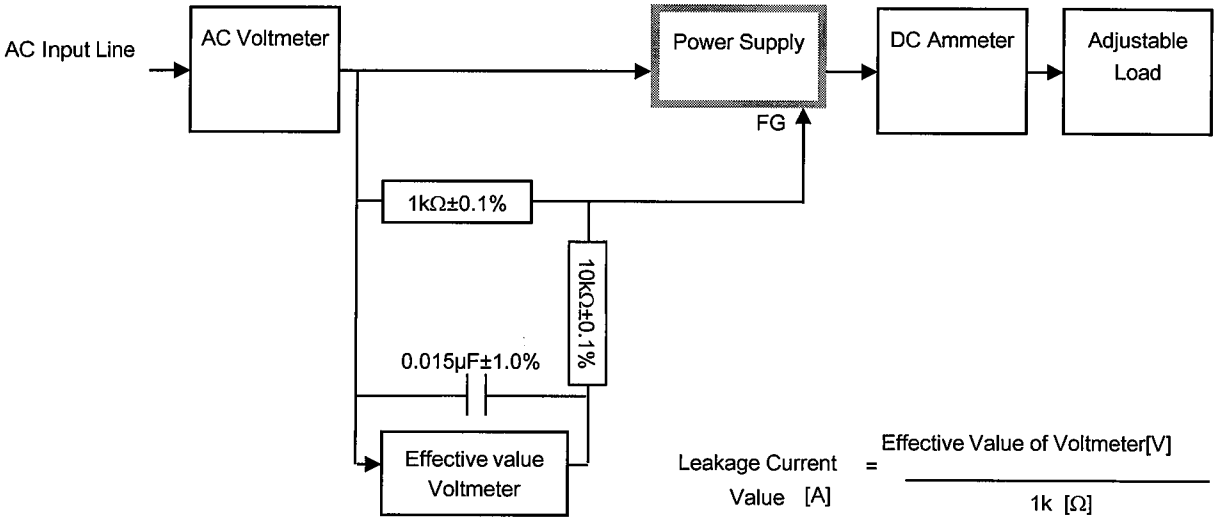


Figure B (IEC60601-1)