

## Test Data

Model Number: OZP-120-12/15

Model Name: DC POWER SUPPLY

Setting: 15V Output settings

INPUT: 85V – 264V AC, 50 / 60 Hz

OUTPUT: 15 V 8.0A (12.0 A<sub>peak</sub>)

Minimum load : 0W

Rated load : 120W

Peak output power: 180W

Approved by : Makoto Urasue (QA manager)

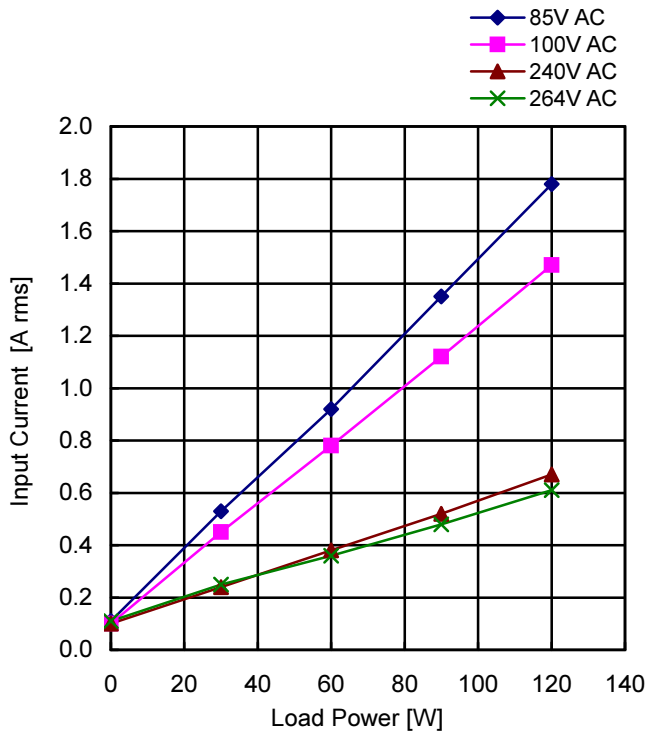
Designed by : Naoki Yamamoto (R&D engineer)

Tested by : Kohei Sawada (Evaluation test engineer)

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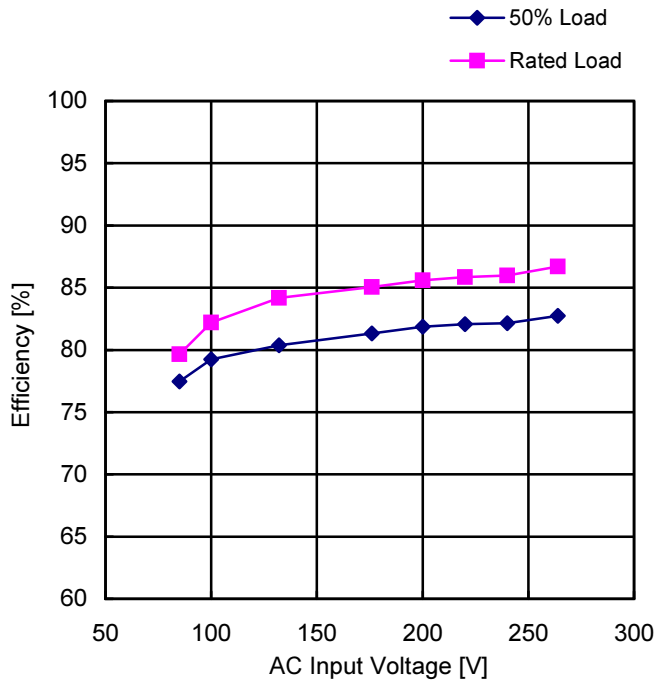
Model	OZP-120-12/15	Temperature: 25°C
Item	Input Current (by Load Power)	Setting: 15V Output Settings



Load Power [W]	Input Current [A rms]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
0.0	0.11	0.10	0.10	0.11
30.0	0.53	0.45	0.24	0.25
60.0	0.92	0.78	0.38	0.36
90.0	1.35	1.12	0.52	0.48
120.0	1.78	1.47	0.67	0.61

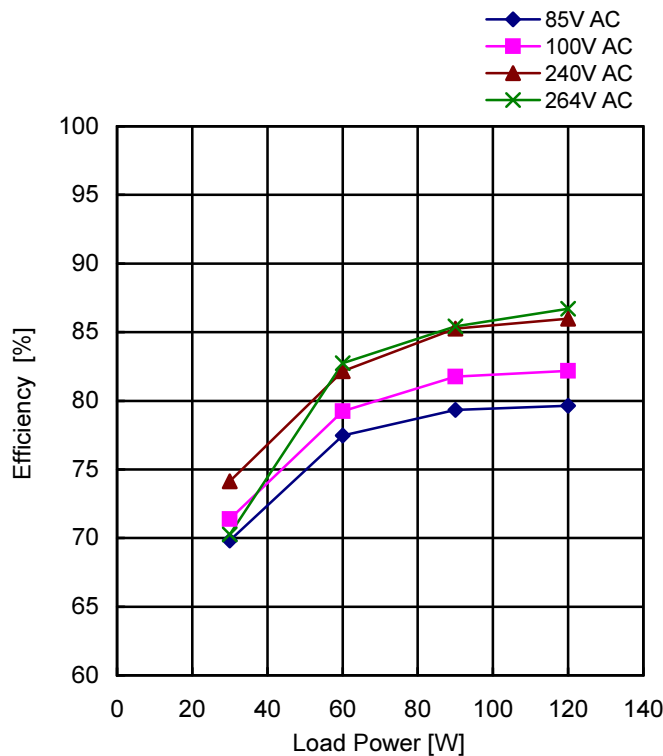
Model	OZP-120-12/15	Temperature: 25°C
Item	Efficiency	Setting: 15V Output Settings

■ Efficiency(by Input Voltage)



AC Input Voltage [V]	Efficiency [%]	
	50% Load	Rated Load
85	77.47	79.64
100	79.23	82.19
132	80.38	84.19
176	81.32	85.07
200	81.85	85.61
220	82.07	85.85
240	82.15	85.97
264	82.74	86.70

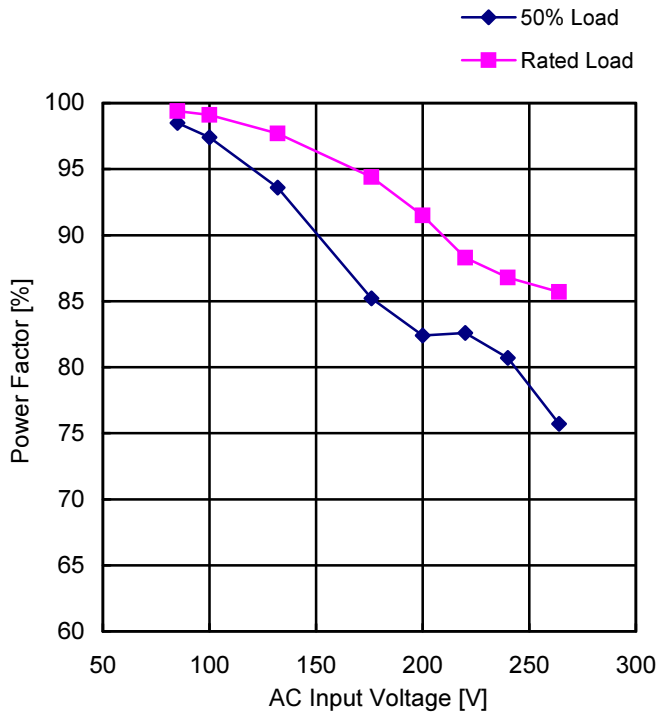
■ Efficiency(by Load Power)



Load Power [W]	Efficiency [%]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
30.0	69.83	71.38	74.14	70.26
60.0	77.47	79.23	82.15	82.74
90.0	79.33	81.76	85.27	85.42
120.0	79.64	82.19	85.97	86.70

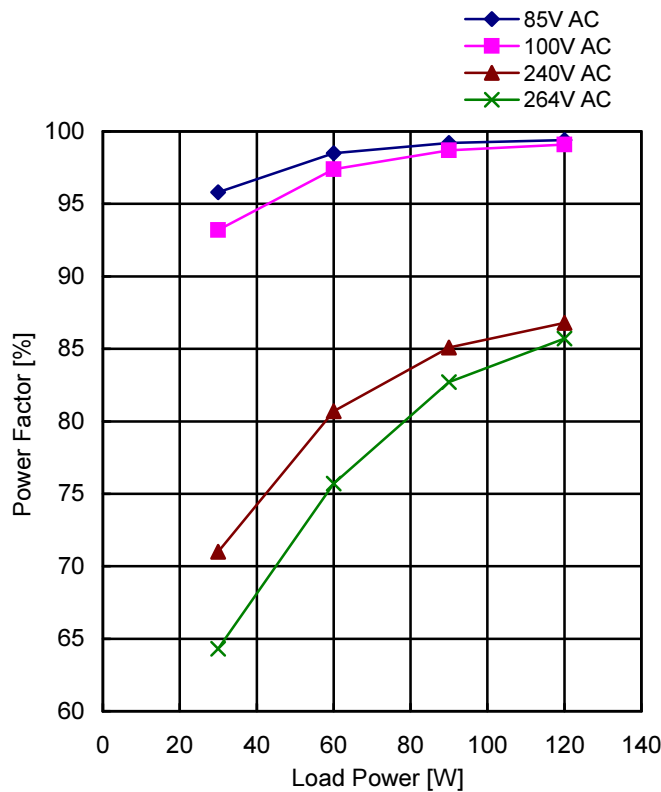
Model	OZP-120-12/15	Temperature: 25°C
Item	Power Factor	Setting: 15V Output Settings

■ Power Factor (by Input Voltage)



AC Input Voltage [V]	Power Factor [%]	
	50% Load	Rated Load
85	98.5	99.4
100	97.4	99.1
132	93.6	97.7
176	85.2	94.4
200	82.4	91.5
220	82.6	88.3
240	80.7	86.8
264	75.7	85.7

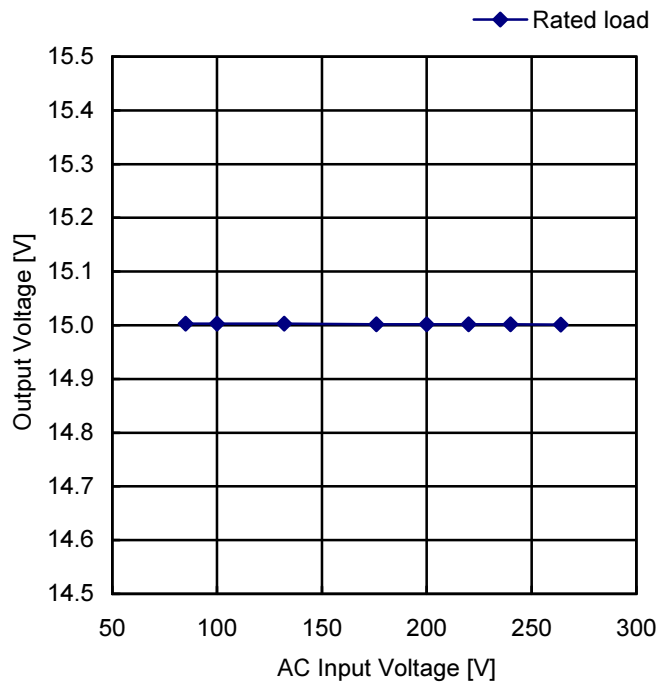
■ Power Factor (by Load Power)



Load Power [W]	Power Factor [%]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
30.0	95.8	93.2	71.0	64.3
60.0	98.5	97.4	80.7	75.7
90.0	99.2	98.7	85.1	82.7
120.0	99.4	99.1	86.8	85.7

Model	OZP-120-12/15	Temperature: 25°C
Item	Line Regulation	Setting: 15V Output Settings

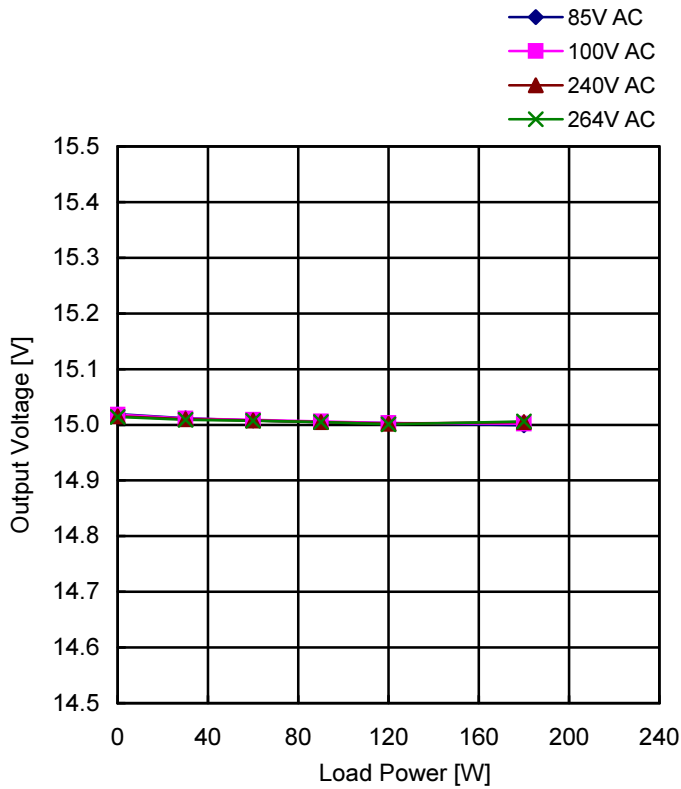
## 15V/8A



AC Input Voltage [V]	Output Voltage [V]
85	15.003
100	15.003
132	15.003
176	15.002
200	15.002
220	15.002
240	15.002
264	15.001

Model	OZP-120-12/15	Temperature: 25°C
Item	Load Regulation	Setting: 15V Output Settings

## 15V



Load Power [W]	Output Voltage [V]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
0.0	15.019	15.018	15.015	15.014
30.0	15.012	15.011	15.010	15.009
60.0	15.008	15.009	15.008	15.007
90.0	15.005	15.006	15.005	15.005
120.0	15.003	15.003	15.002	15.001
180.0	14.999	15.002	15.005	15.006

Load Power [W]	Load Condition	
	Load Current [A]	
0.0	0.00	
30.0	2.00	
60.0	4.00	
90.0	6.00	
120.0	8.00	
180.0	12.00	

Model	OZP-120-12/15	Setting: 15V Output Settings																																													
Item	Ambient Temperature Drift																																														
<p><b>15V</b></p> <p>Legend:</p> <ul style="list-style-type: none"> <li>85V AC</li> <li>100V AC</li> <li>240V AC</li> <li>264V AC</li> </ul>		<table border="1"> <thead> <tr> <th rowspan="2">Ambient Temp. (°C)</th> <th colspan="4">Output Voltage [V]</th> </tr> <tr> <th>Input Voltage 85V AC</th> <th>Input Voltage 100V AC</th> <th>Input Voltage 240V AC</th> <th>Input Voltage 264V AC</th> </tr> </thead> <tbody> <tr> <td>-15</td> <td>15.061</td> <td>15.061</td> <td>15.060</td> <td>15.060</td> </tr> <tr> <td>25</td> <td>15.003</td> <td>15.003</td> <td>15.002</td> <td>15.001</td> </tr> <tr> <td>50</td> <td>14.935</td> <td>14.935</td> <td>14.934</td> <td>14.933</td> </tr> <tr> <td>65</td> <td>14.936</td> <td>14.936</td> <td>14.935</td> <td>14.935</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th colspan="2">Load Condition</th> </tr> <tr> <th rowspan="2">Ambient Temp. (°C)</th> <th>Load Current [A]</th> </tr> <tr> <th>15V</th> </tr> </thead> <tbody> <tr> <td>-15</td> <td>8.00</td> </tr> <tr> <td>25</td> <td>8.00</td> </tr> <tr> <td>50</td> <td>8.00</td> </tr> <tr> <td>65</td> <td>4.67</td> </tr> </tbody> </table>				Ambient Temp. (°C)	Output Voltage [V]				Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC	-15	15.061	15.061	15.060	15.060	25	15.003	15.003	15.002	15.001	50	14.935	14.935	14.934	14.933	65	14.936	14.936	14.935	14.935	Load Condition		Ambient Temp. (°C)	Load Current [A]	15V	-15	8.00	25	8.00	50	8.00	65	4.67
Ambient Temp. (°C)	Output Voltage [V]																																														
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC																																											
-15	15.061	15.061	15.060	15.060																																											
25	15.003	15.003	15.002	15.001																																											
50	14.935	14.935	14.934	14.933																																											
65	14.936	14.936	14.935	14.935																																											
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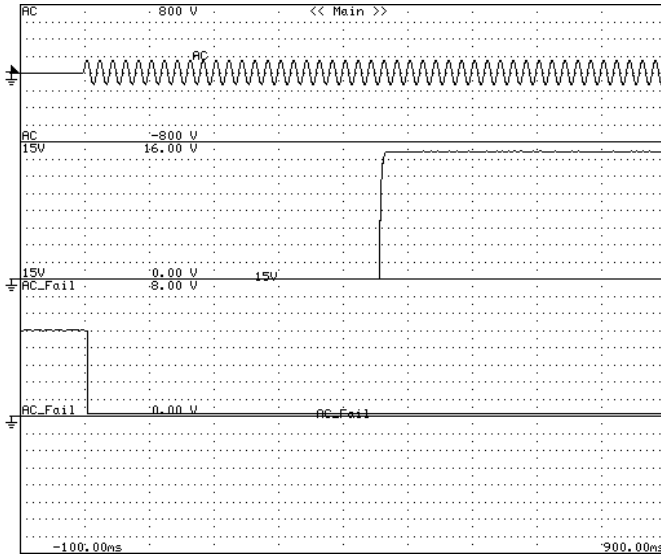


Model	OZP-120-12/15	Temperature: 25°C
Item	Output Rise Characteristics (at AC Power ON)	Setting: 15V Output Settings

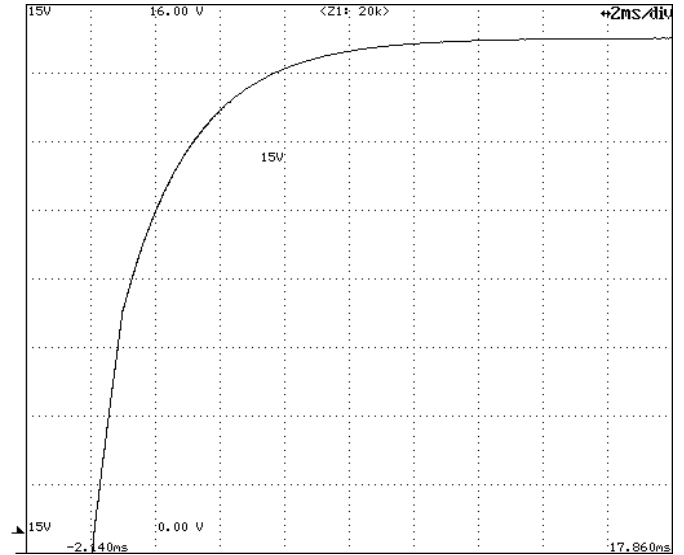
Input: 100V AC  
Load: Rated Load

Timebase Range: 100ms/div

Vertical Sensitivity: 2V/div  
Timebase Range: 2ms/div



All Output Start-up Sequence

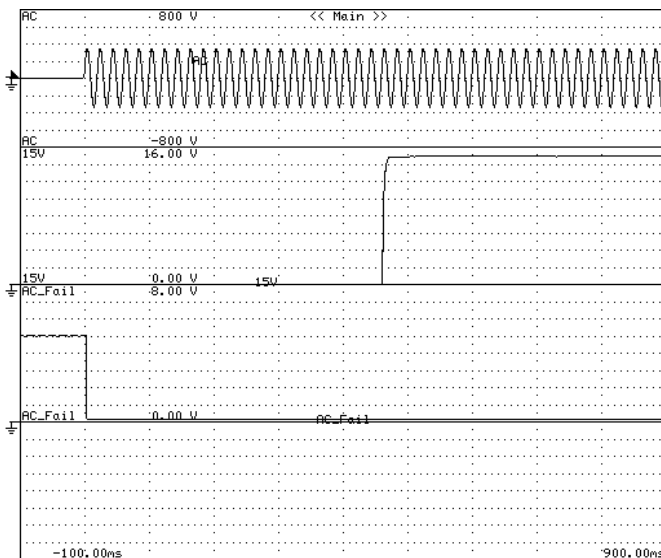


15V DC Output Rise Characteristics

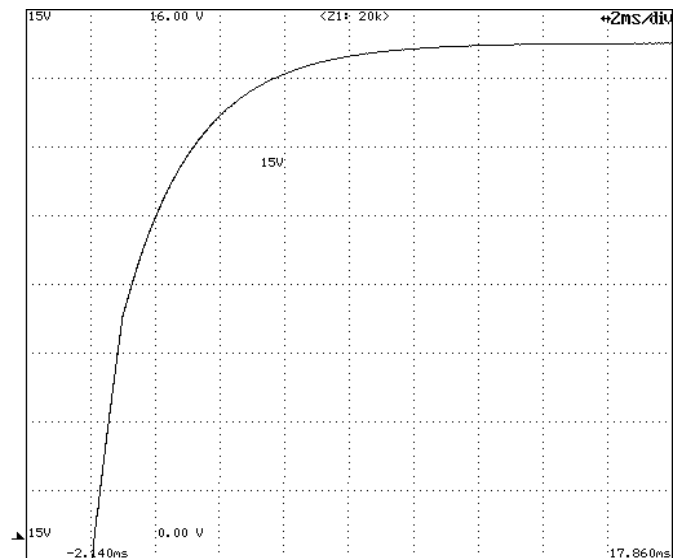
Input: 240V AC  
Load: Rated Load

Timebase Range: 100ms/div

Vertical Sensitivity: 2V/div  
Timebase Range: 2ms/div



All Output Start-up Sequence



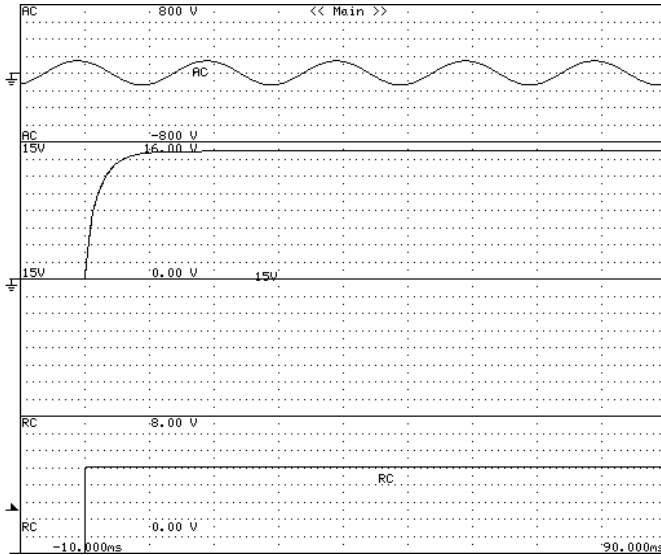
15V DC Output Rise Characteristics

Model	OZP-120-12/15	Temperature: 25°C
Item	Output Rise Characteristics (at Remote ON)	Setting: 15V Output Settings

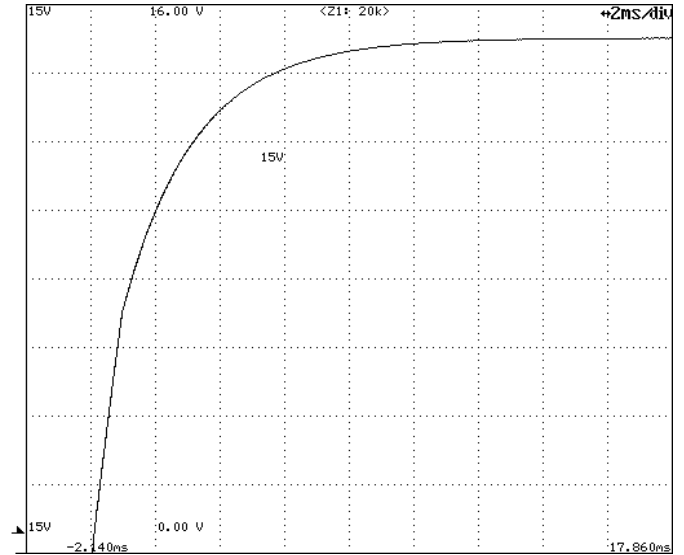
Input: 100V AC  
Load: Rated Load

Timebase Range: 10ms/div

Vertical Sensitivity: 2V/div  
Timebase Range: 2ms/div



All Output Start-up Sequence

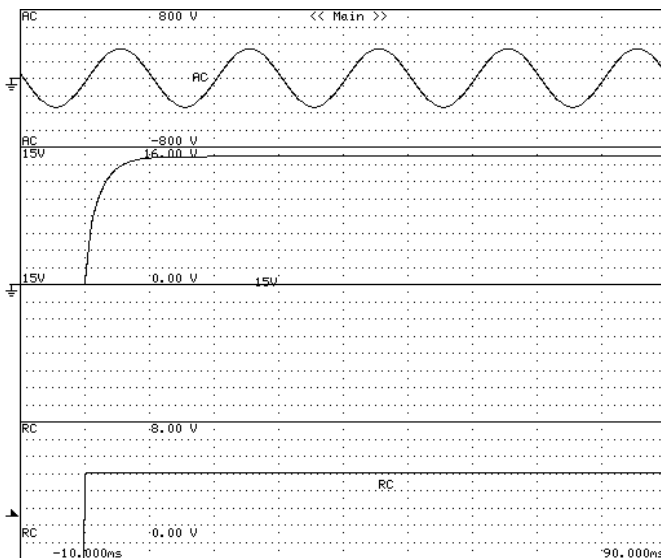


15V DC Output Rise Characteristics

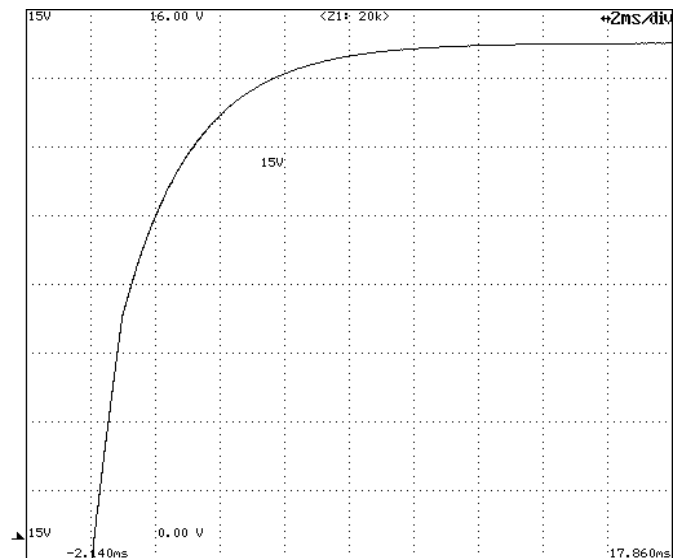
Input: 240V AC  
Load: Rated Load

Timebase Range: 10ms/div

Vertical Sensitivity: 2V/div  
Timebase Range: 2ms/div



All Output Start-up Sequence

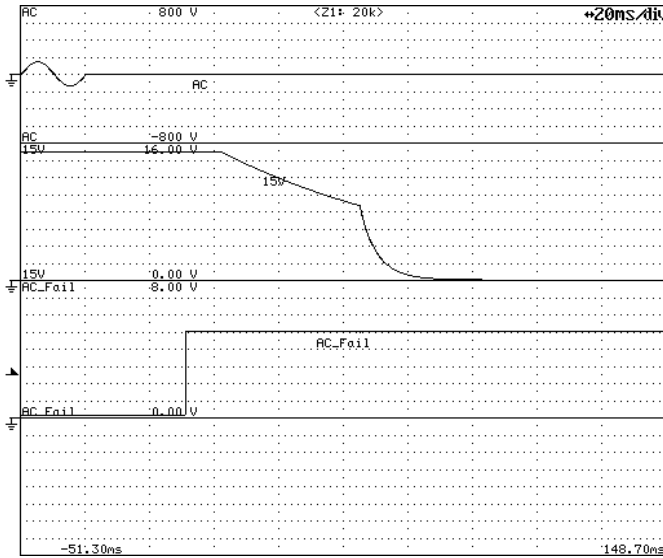


15V DC Output Rise Characteristics

Model	OZP-120-12/15	Temperature: 25°C
Item	Output Fall Characteristics (at AC Power OFF)	Setting: 15V Output Settings

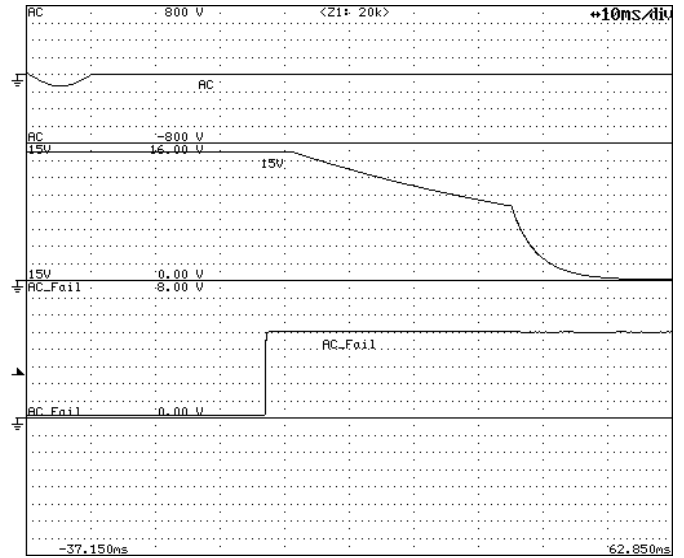
Input: 100V AC  
Load: Rated Load

Timebase Range: 20ms/div



Output Fall Characteristics

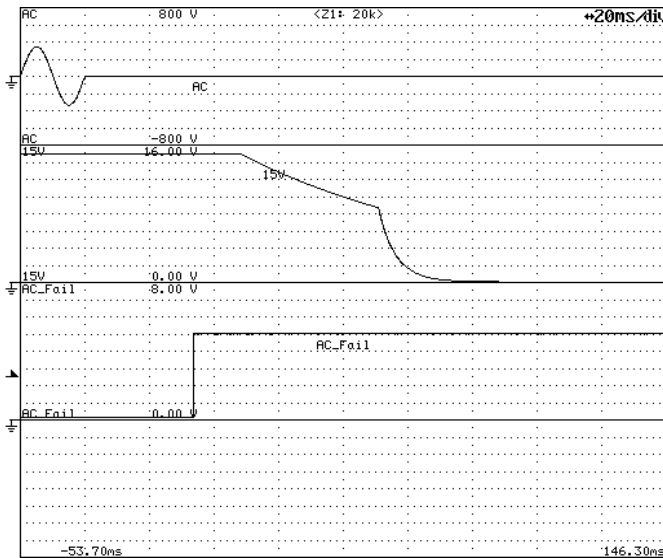
Timebase Range: 10ms/div



Output Fall Characteristics (magnification)

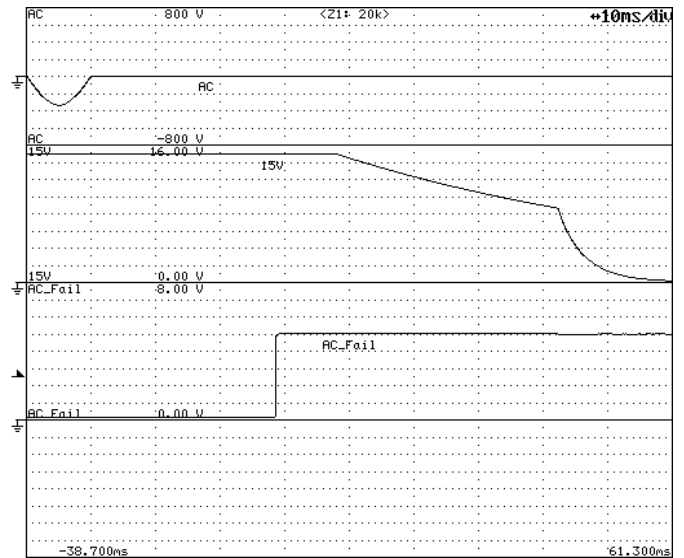
Input: 240V AC  
Load: Rated Load

Timebase Range: 20ms/div



Output Fall Characteristics

Timebase Range: 10ms/div

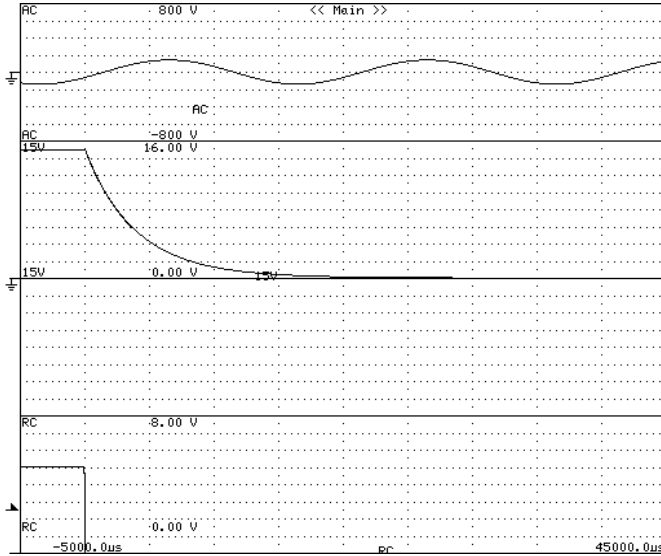


Output Fall Characteristics (magnification)

Model	OZP-120-12/15	Temperature: 25°C
Item	Output Fall Characteristics (at Remote OFF)	Setting: 15V Output Settings

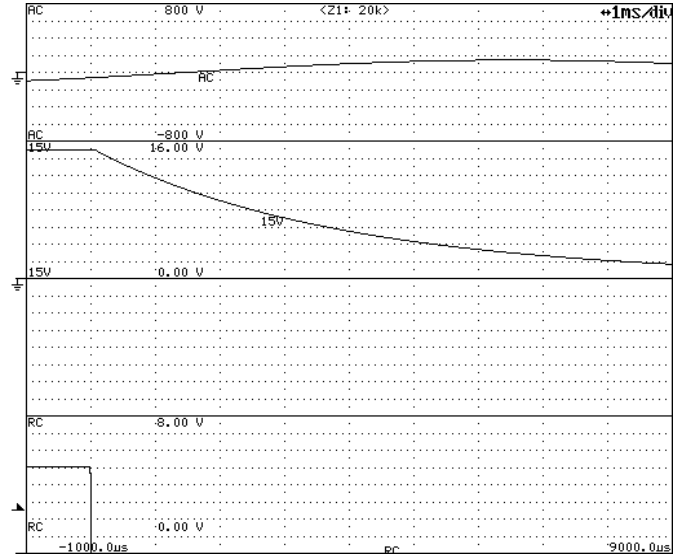
Input: 100V AC  
Load: Rated Load

Timebase Range: 5ms/div



Output Fall Characteristics

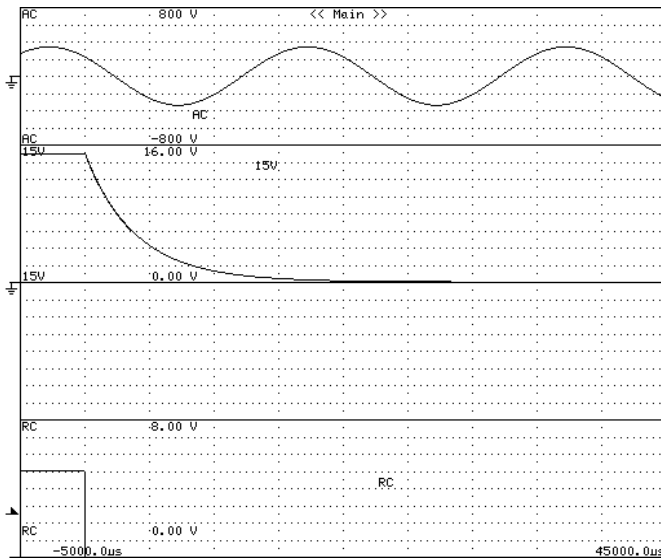
Timebase Range: 1ms/div



Output Fall Characteristics (magnification)

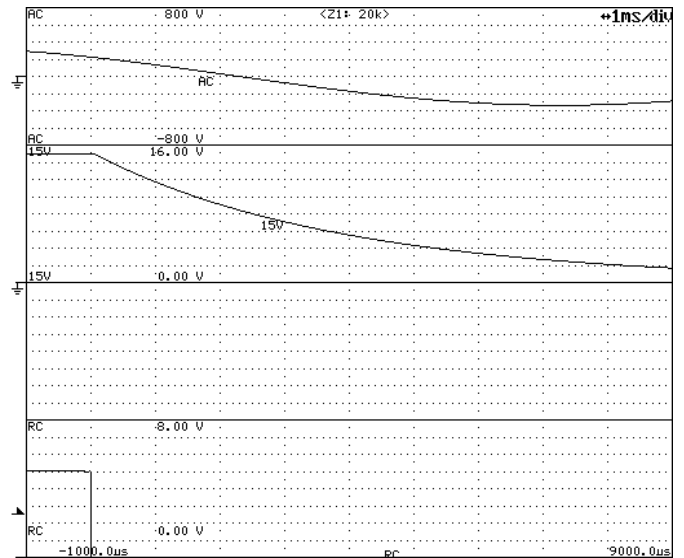
Input: 240V AC  
Load: Rated Load

Timebase Range: 5ms/div



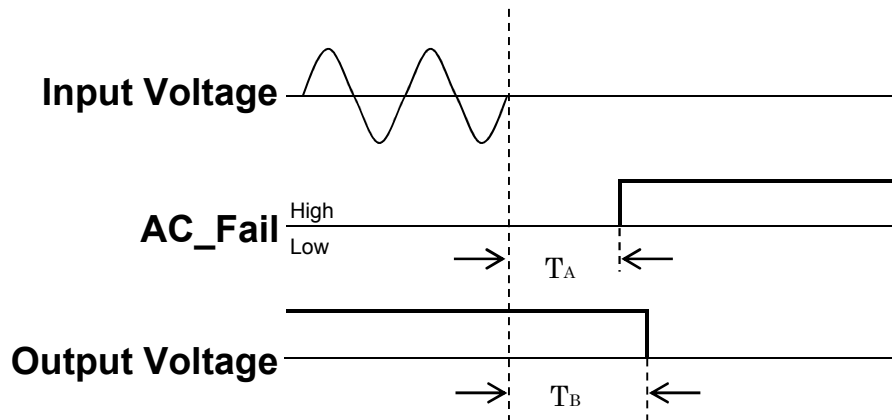
Output Fall Characteristics

Timebase Range: 1ms/div

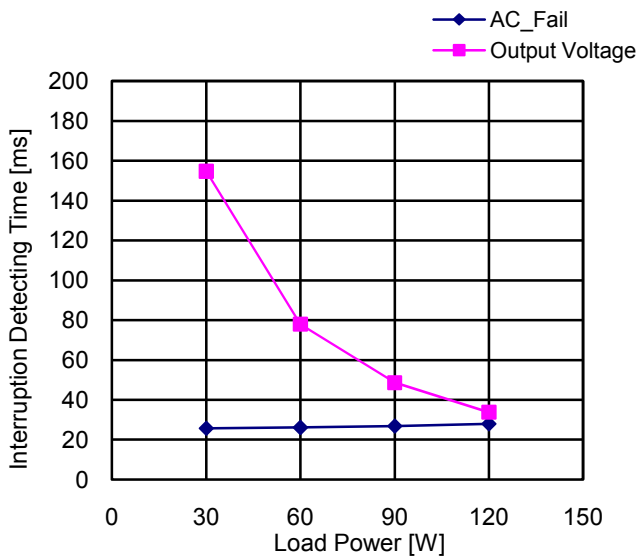


Output Fall Characteristics (magnification)

Model	OZP-120-12/15	Temperature: 25°C
Item	Instantaneous Interruption Compensation (by Load Power)	Setting: 15V Output Settings

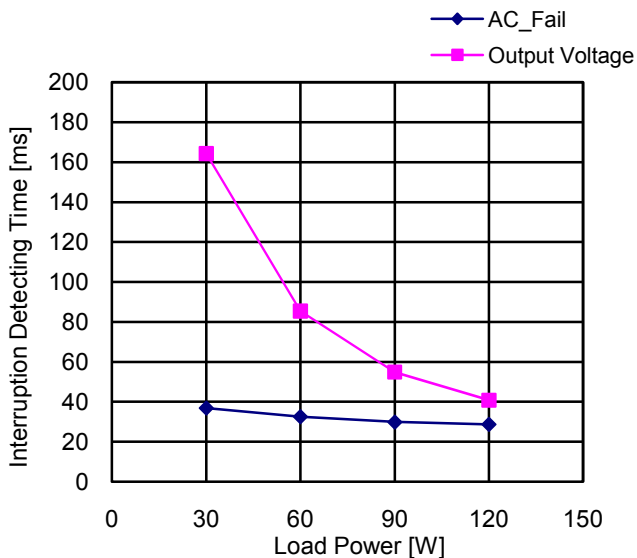


## Input Voltage: 100V AC



Load Power [W]	Interruption Detecting Time [ms]	
	AC_Fail	Output Voltage
	TA	TB
30.0	25.7	154.7
60.0	26.1	78.0
90.0	26.8	48.6
120.0	27.9	33.8

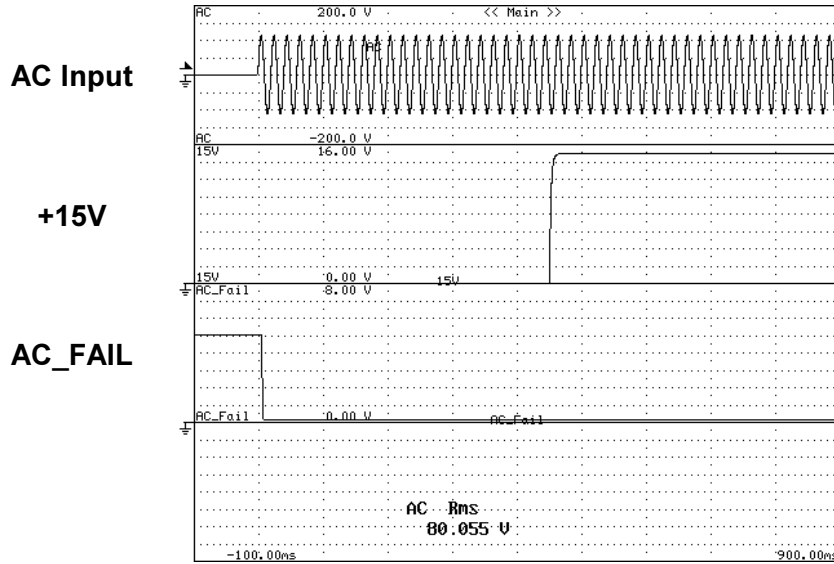
## Input Voltage: 240V AC



Load Power [W]	Interruption Detecting Time [ms]	
	AC_Fail	Output Voltage
	TA	TB
30.0	36.9	164.3
60.0	32.5	85.4
90.0	29.9	54.9
120.0	28.7	40.8

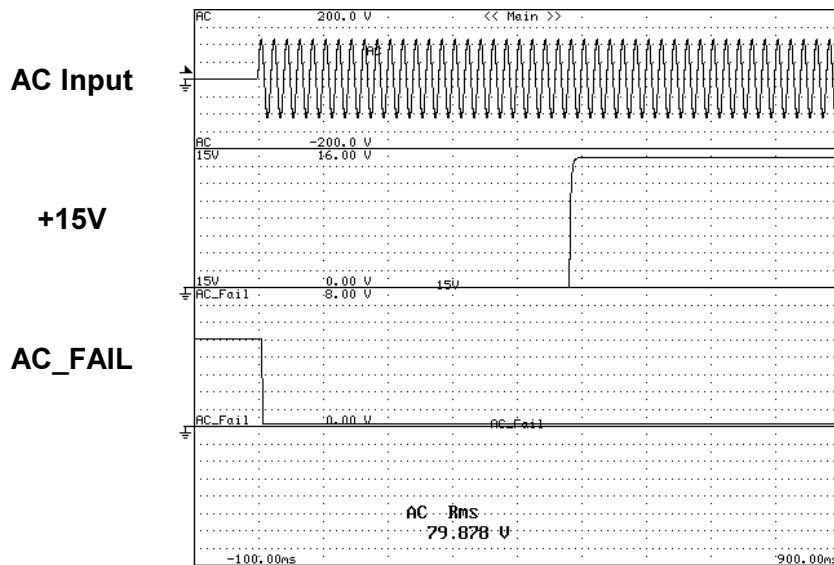
Model	OZP-120-12/15	Temperature: 25°C
Item	Start-Up Voltage	Setting: 15V Output Settings

**Timebase Range: 100ms/div**  
**Load: Rated Load**



**Start-up Voltage: 80.1V AC**

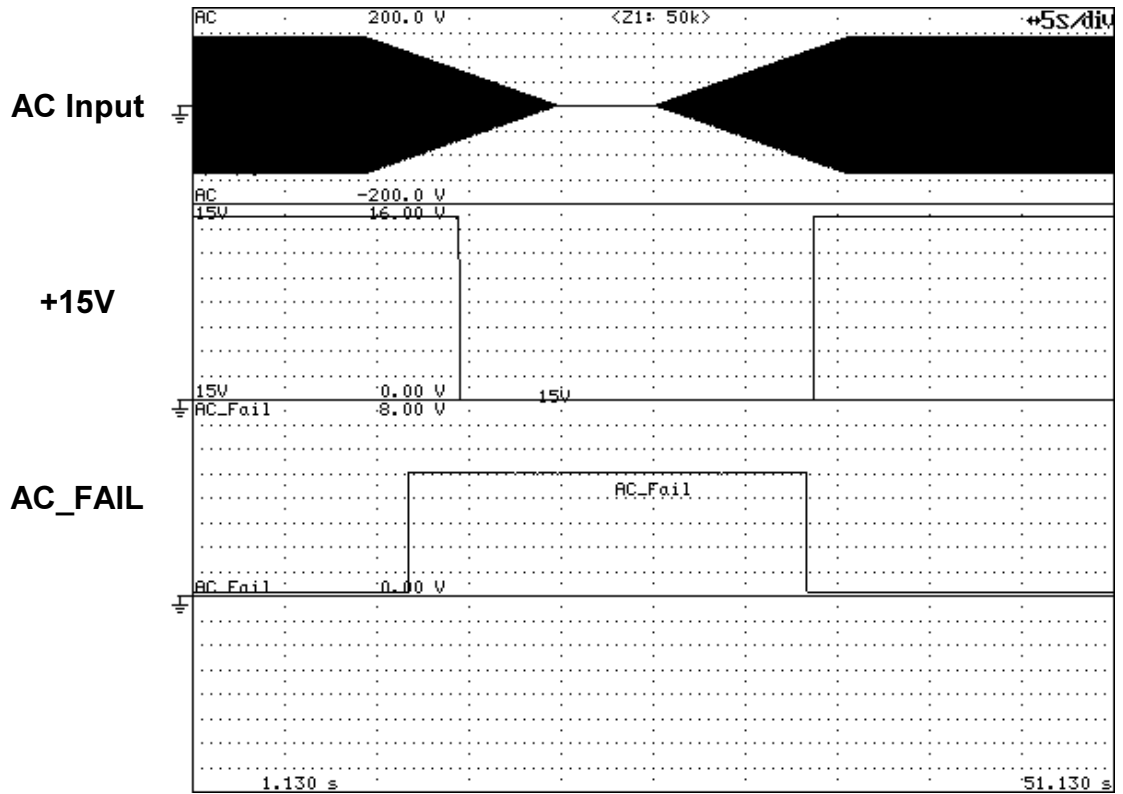
**Timebase Range: 100ms/div**  
**Load: Minimum Load**



**Start-up Voltage: 79.9V AC**

Model	OZP-120-12/15	Temperature: 25°C
Item	Input Voltage Sweep Up/Down	Setting: 15V Output Settings

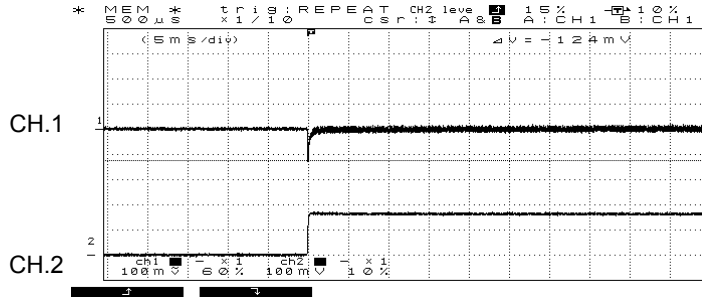
Timebase Range: 5s/div  
Load: Rated Load



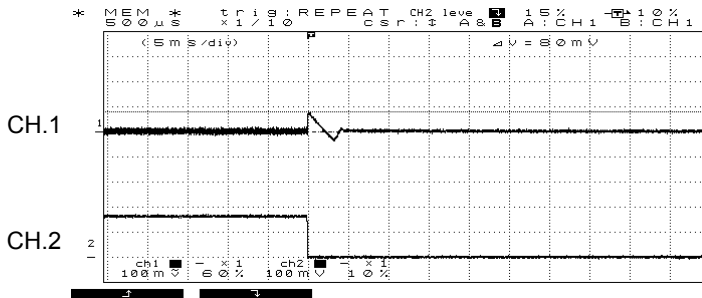
Sweep Rate: 10Vave/sec

Model	OZP-120-12/15	Temperature: 25°C
Item	Dynamic Load Response	Setting: 15V Output Settings

## +15V DC Output Transient Response Waveforms

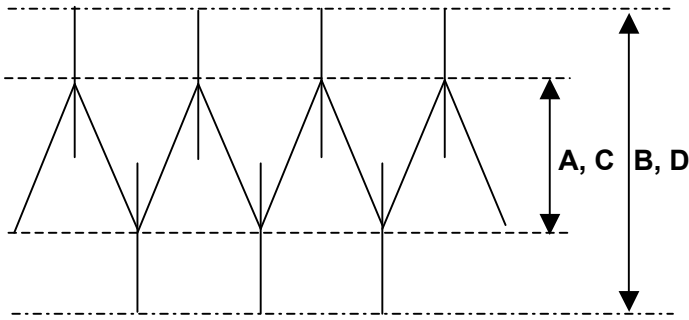


Waveform 1	
CH1	Measuring Point: DC Output Voltage
	Vertical Sensitivity: 100mV/div
CH2	Measuring Point: DC Output Current
	Vertical Sensitivity: 5A/div
Timebase Range	5ms/div
Condition	Input: 100V AC
Note: Rated Load(8A) ⇒ Minimum load(0A)	





Model	OZP-120-12/15	Load: Rated Load
Item	Ambient Temperature Drift	Setting: 15V Output Settings



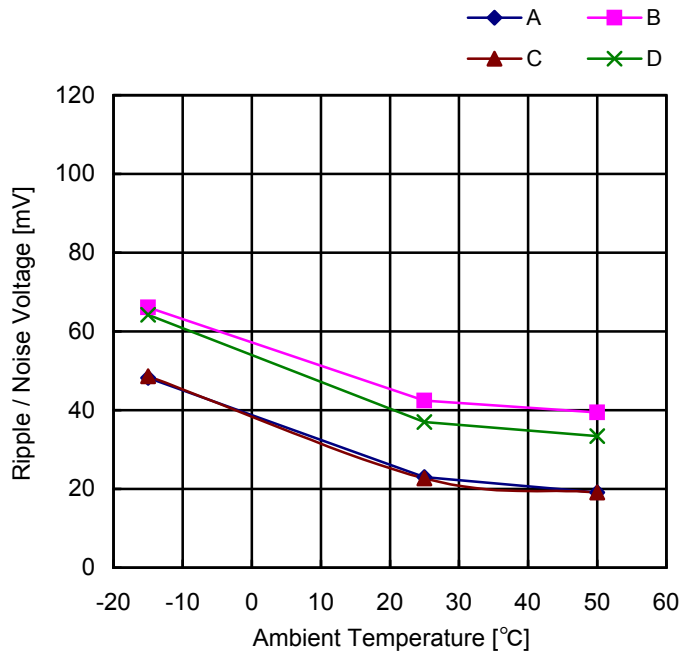
**at 100V AC**

A: Ripple Voltage (mV<sub>P-P</sub>)  
B: Noise Voltage (mV<sub>P-P</sub>)

**at 240V AC**

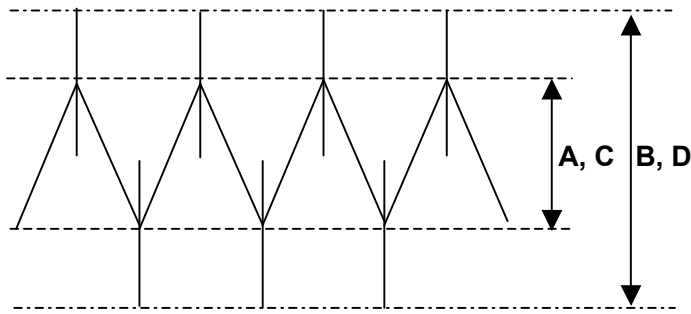
C: Ripple Voltage (mV<sub>P-P</sub>)  
D: Noise Voltage (mV<sub>P-P</sub>)

**15V**



Ambient Temp. [°C]	Ripple / Noise Voltage [mV]			
	A	B	C	D
-15	48.2	66.1	48.6	64.2
25	23.0	42.4	22.7	37.0
50	19.1	39.4	19.1	33.4

Model	OZP-120-12/15	Temperature: 25°C
Item	Ambient Temperature Drift	Setting: 15V Output Settings



**at 100V AC**

A: Ripple Voltage (mV<sub>P-P</sub>)

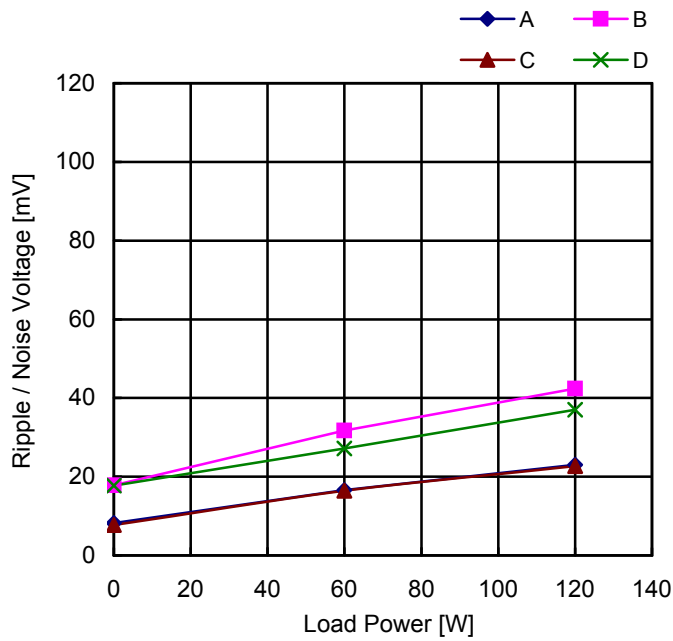
B: Noise Voltage (mV<sub>P-P</sub>)

**at 240V AC**

C: Ripple Voltage (mV<sub>P-P</sub>)

D: Noise Voltage (mV<sub>P-P</sub>)

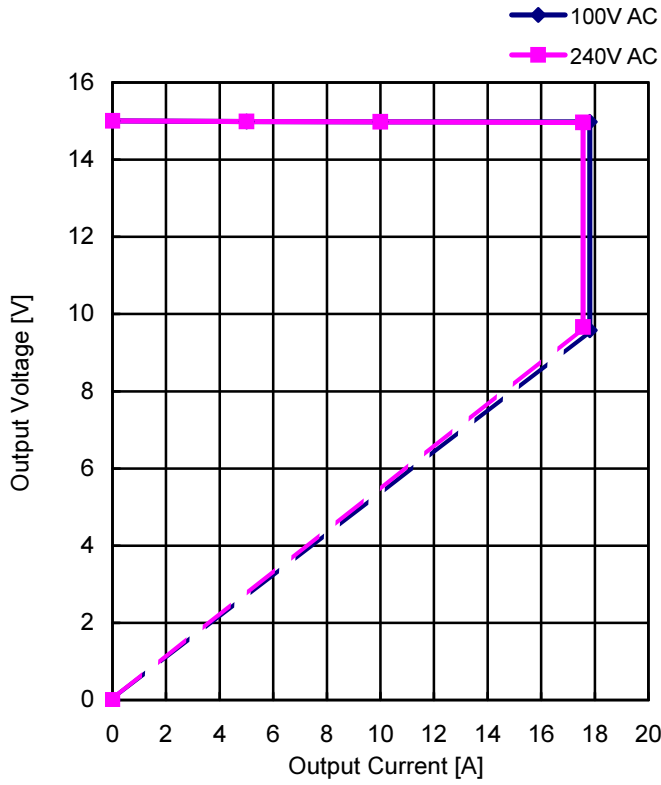
## 15V



Load Power [W]	Ripple / Noise Voltage [mV]			
	A	B	C	D
0	8.2	17.8	7.7	17.7
60	16.6	31.7	16.4	27.2
120	23.0	42.4	22.7	37.0

Model	OZP-120-12/15	Temperature: 25°C
Item	Over-Current Protection	Setting: 15V Output Settings

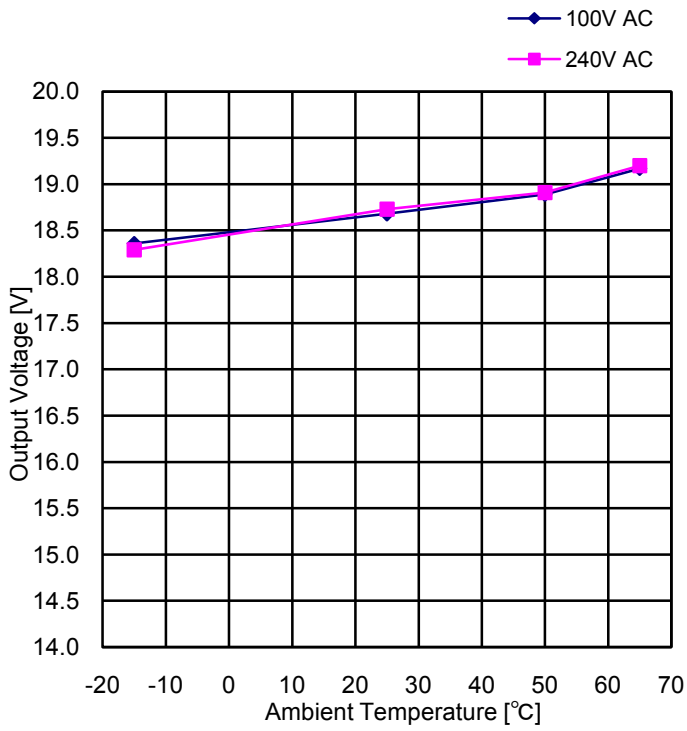
## V-I Characteristics of 15V O.C.P



Input Voltage: 100V AC		Input Voltage: 240V AC	
Output Current [A]	Output Voltage [V]	Output Current [A]	Output Voltage [V]
0.00	15.00	0.00	15.00
5.00	14.99	5.00	14.99
10.00	14.98	10.00	14.98
17.81	14.98	17.56	14.96

Model	OZP-120-12/15	Load: Minimum Load
Item	Over-Voltage Protection	Setting: 15V Output Settings

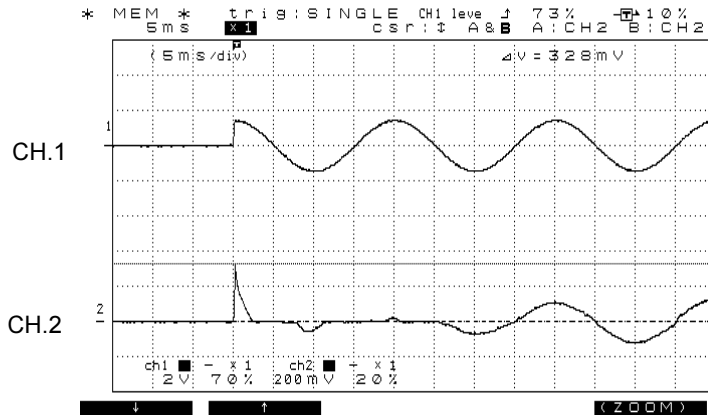
## 15V



Ambient Temp. [°C]	Output Voltage [V]	
	100V AC	240V AC
-15	18.36	18.29
25	18.68	18.73
50	18.89	18.91
65	19.17	19.20

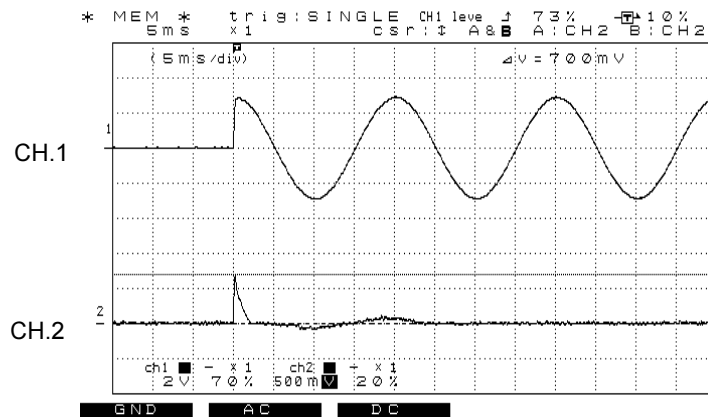
Model	OZP-120-12/15	Temperature: 25°C	Load: Rated Load
Item	Inrush Current	Setting: 15V Output Settings	

## Inrush Current Waveforms



### Waveform 1

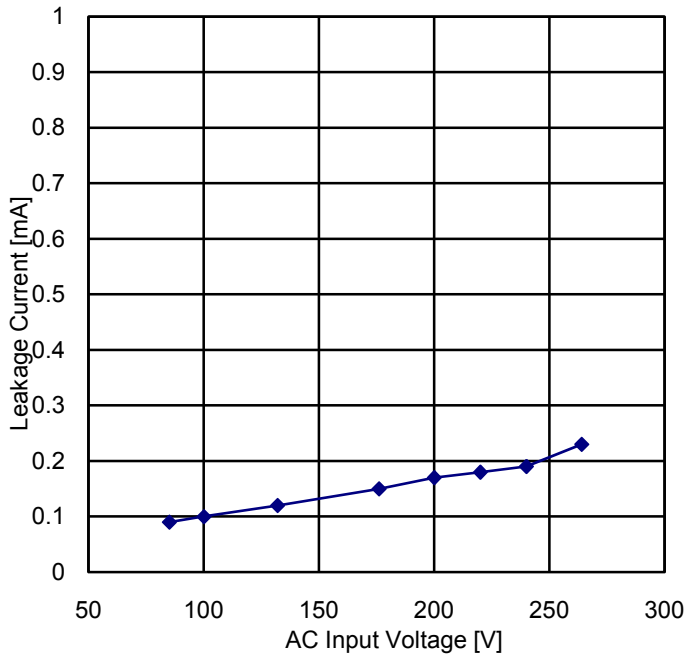
CH1	Measuring Point:	AC Input Voltage
	Range:	200V/div
CH2	Measuring Point:	AC Input Current
	Range:	10A/div
Timebase Range	5ms/div	
Conditions	Input: 100V AC Load: Rated Load	
Note: Inrush Current: 16.4A		



### Waveform 2

CH1	Measuring Point:	AC Input Voltage
	Range:	200V/div
CH2	Measuring Point:	AC Input Current
	Range:	25A/div
Timebase Range	5ms/div	
Conditions	Input: 200V AC Load: Rated Load	
Note: Inrush Current: 35.0A		

Model	OZP-120-12/15	Load: Rated Load
Item	Leakage Current	Setting: 15V Output Settings



AC Input Voltage [V]	Leakage Current [mA]
85	0.09
100	0.10
132	0.12
176	0.15
200	0.17
220	0.18
240	0.19
264	0.23