

## Test Data

Model Number: UZP-220-24

Model Name: DC POWER SUPPLY

INPUT: 85V – 264V AC, 50 / 60 Hz

OUTPUT: 24V 9.2A (16.7 A<sub>peak</sub>)

Minimum load : 0W  
Rated load : 220.8W  
Peak output power: 400.8W

Approved by : T. S. S. S. (QA manager)  
Designed by : Kazuhiko Yamada (R&D engineer)  
Tested by : Hiroyuki Watanabe (Evaluation test engineer)

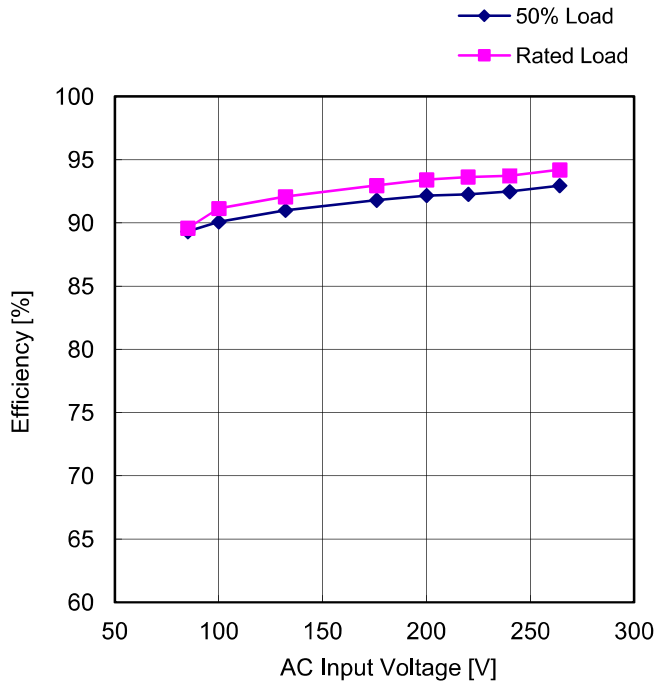
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Model	UZF-220-24	Temperature: 25°C																																		
Item	Input Current (by Load Power)																																			
		<table border="1"> <thead> <tr> <th rowspan="2">Load Power [W]</th> <th colspan="4">Input Current [A rms]</th> </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>0.0</td> <td>0.09</td> <td>0.08</td> <td>0.11</td> <td>0.09</td> </tr> <tr> <td>55.2</td> <td>0.78</td> <td>0.67</td> <td>0.40</td> <td>0.33</td> </tr> <tr> <td>110.4</td> <td>1.46</td> <td>1.24</td> <td>0.66</td> <td>0.55</td> </tr> <tr> <td>165.6</td> <td>2.16</td> <td>1.83</td> <td>0.94</td> <td>0.77</td> </tr> <tr> <td>220.8</td> <td>2.91</td> <td>2.42</td> <td>1.23</td> <td>0.98</td> </tr> </tbody> </table>	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	0.09	0.08	0.11	0.09	55.2	0.78	0.67	0.40	0.33	110.4	1.46	1.24	0.66	0.55	165.6	2.16	1.83	0.94	0.77	220.8	2.91	2.42	1.23	0.98
Load Power [W]	Input Current [A rms]																																			
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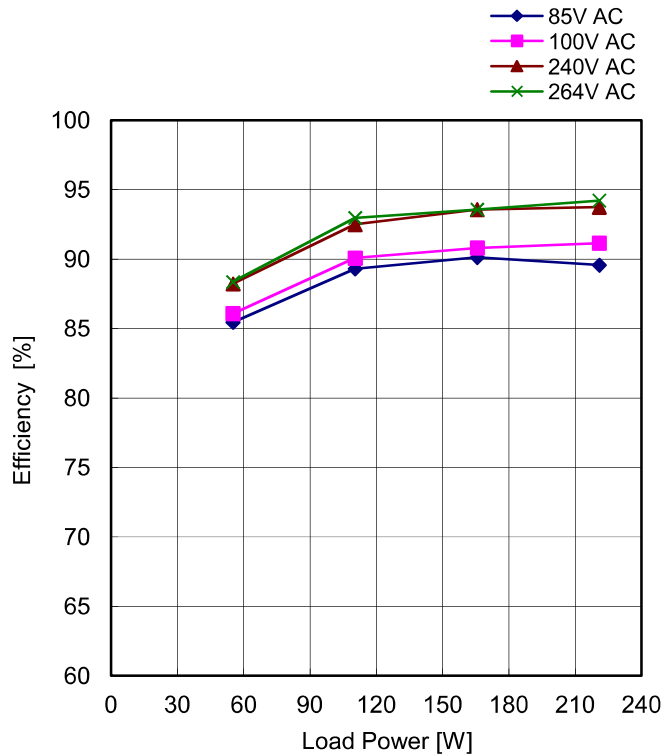
Model	UZP-220-24	Temperature: 25°C
Item	Efficiency	

### ■ Efficiency(by Input Voltage)



AC Input Voltage [V]	Efficiency [%]	
	50% Load	Rated Load
85	89.32	89.58
100	90.08	91.16
132	91.01	92.09
176	91.82	92.97
200	92.18	93.43
220	92.28	93.65
240	92.50	93.74
264	92.97	94.21

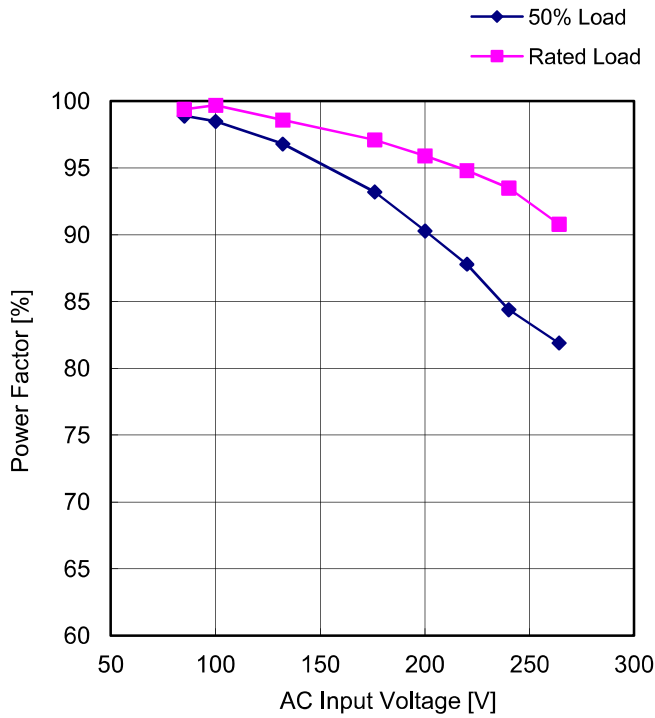
### ■ Efficiency(by Load Power)



Load Power [W]	Efficiency [%]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
55.2	85.45	86.07	88.23	88.36
110.4	89.32	90.08	92.50	92.97
165.6	90.14	90.81	93.57	93.57
220.8	89.58	91.16	93.74	94.21

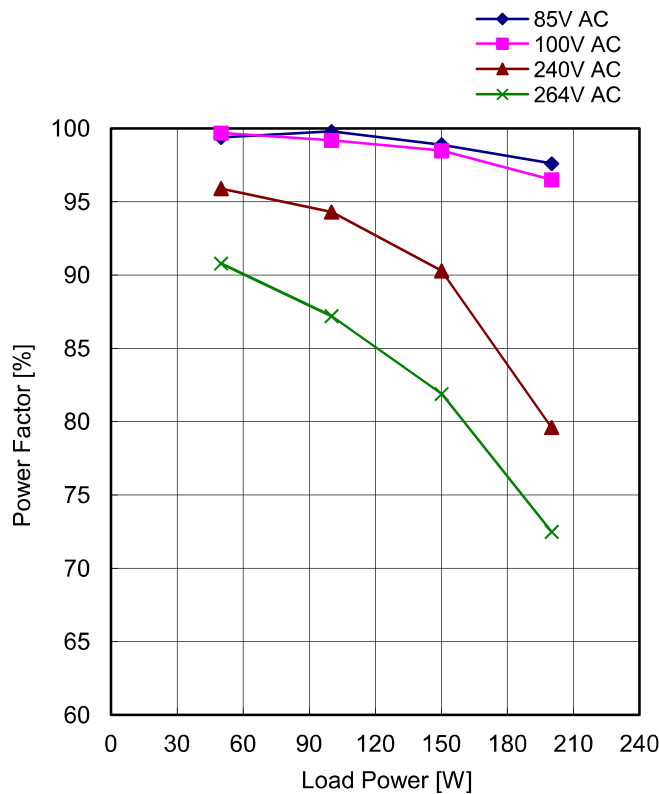
Model	UZP-220-24	Temperature: 25°C
Item	Power Factor	

■ Power Factor (by Input Voltage)



AC Input Voltage [V]	Power Factor [%]	
	50% Load	Rated Load
85	98.9	99.4
100	98.5	99.7
132	96.8	98.6
176	93.2	97.1
200	90.3	95.9
220	87.8	94.8
240	84.4	93.5
264	81.9	90.8

■ Power Factor (by Load Power)



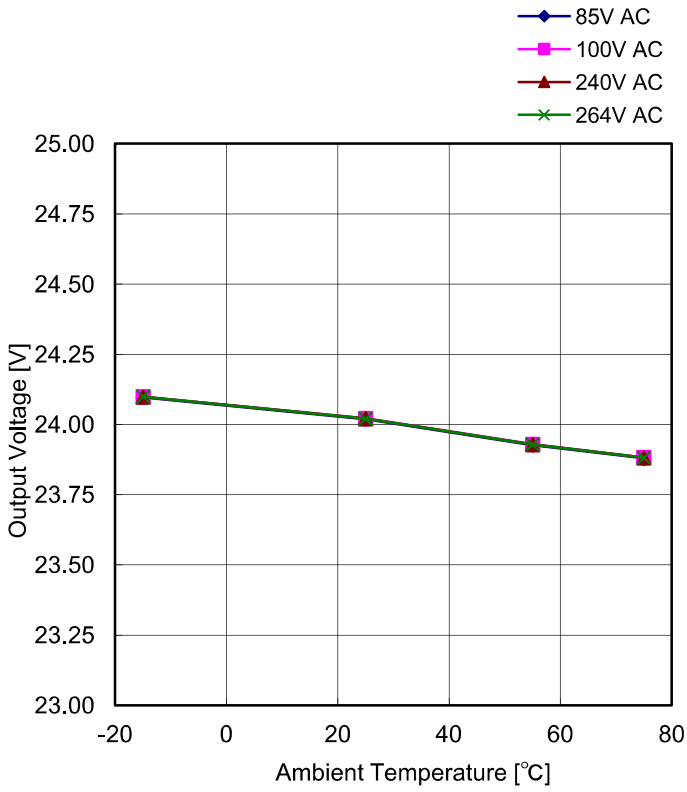
Load Power [W]	Power Factor [%]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
50.0	99.4	99.7	95.9	90.8
100.0	99.8	99.2	94.3	87.2
150.0	98.9	98.5	90.3	81.9
200.0	97.6	96.5	79.6	72.5

Model	UZP-220-24	Temperature: 25°C																		
Item	Line Regulation																			
<p>The graph plots Output Voltage [V] on the y-axis (ranging from 23.00 to 25.00) against AC Input Voltage [V] on the x-axis (ranging from 50 to 300). A single data series labeled 'Rated load' is shown as a blue line with diamond markers. The output voltage remains very stable, fluctuating only slightly around 24.00V across the entire input range.</p>		<table border="1"> <thead> <tr> <th>AC Input Voltage [V]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr> <td>85</td> <td>24.019</td> </tr> <tr> <td>100</td> <td>24.022</td> </tr> <tr> <td>132</td> <td>24.021</td> </tr> <tr> <td>176</td> <td>24.021</td> </tr> <tr> <td>200</td> <td>24.022</td> </tr> <tr> <td>220</td> <td>24.021</td> </tr> <tr> <td>240</td> <td>24.021</td> </tr> <tr> <td>264</td> <td>24.021</td> </tr> </tbody> </table>	AC Input Voltage [V]	Output Voltage [V]	85	24.019	100	24.022	132	24.021	176	24.021	200	24.022	220	24.021	240	24.021	264	24.021
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<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">Load Power [W]</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>0.0</td> <td>24.038</td> <td>24.038</td> <td>24.039</td> <td>24.035</td> </tr> <tr> <td>55.2</td> <td>24.033</td> <td>24.032</td> <td>24.033</td> <td>24.030</td> </tr> <tr> <td>110.4</td> <td>24.030</td> <td>24.030</td> <td>24.031</td> <td>24.028</td> </tr> <tr> <td>165.6</td> <td>24.026</td> <td>24.025</td> <td>24.026</td> <td>24.023</td> </tr> <tr> <td>220.8</td> <td>24.021</td> <td>24.021</td> <td>24.022</td> <td>24.019</td> </tr> <tr> <td>400.8</td> <td>24.023</td> <td>24.022</td> <td>24.011</td> <td>24.009</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th rowspan="2">Load Power [W]</th> <th colspan="2">Load Condition</th> </tr> <tr> <th colspan="2">Load Current [A]</th> </tr> </thead> <tbody> <tr> <td>0.0</td> <td colspan="2">24V</td> </tr> <tr> <td>50.4</td> <td colspan="2">0.00</td> </tr> <tr> <td>100.8</td> <td colspan="2">2.10</td> </tr> <tr> <td>151.2</td> <td colspan="2">4.20</td> </tr> <tr> <td>201.6</td> <td colspan="2">6.30</td> </tr> <tr> <td>400.8</td> <td colspan="2">8.40</td> </tr> <tr> <td></td> <td colspan="2">16.70</td> </tr> </tbody> </table>	Load Power [W]	Output Voltage [V]				Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC	0.0	24.038	24.038	24.039	24.035	55.2	24.033	24.032	24.033	24.030	110.4	24.030	24.030	24.031	24.028	165.6	24.026	24.025	24.026	24.023	220.8	24.021	24.021	24.022	24.019	400.8	24.023	24.022	24.011	24.009	Load Power [W]	Load Condition		Load Current [A]		0.0	24V		50.4	0.00		100.8	2.10		151.2	4.20		201.6	6.30		400.8	8.40			16.70	
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Model UZP-220-24

Item Ambient Temperature Drift



Ambient Temp. (°C)	Output Voltage [V]			
	Input Voltage 85V AC	Input Voltage 100V AC	Input Voltage 240V AC	Input Voltage 264V AC
-15	24.096	24.099	24.098	24.099
25	24.019	24.022	24.021	24.021
55	23.927	23.930	23.929	23.929
75	23.880	23.883	23.882	23.882

### Load Condition

Ambient Temp. (°C)	Load Current [A]
	24V
-15	9.20
25	9.20
55	9.20
75	5.50

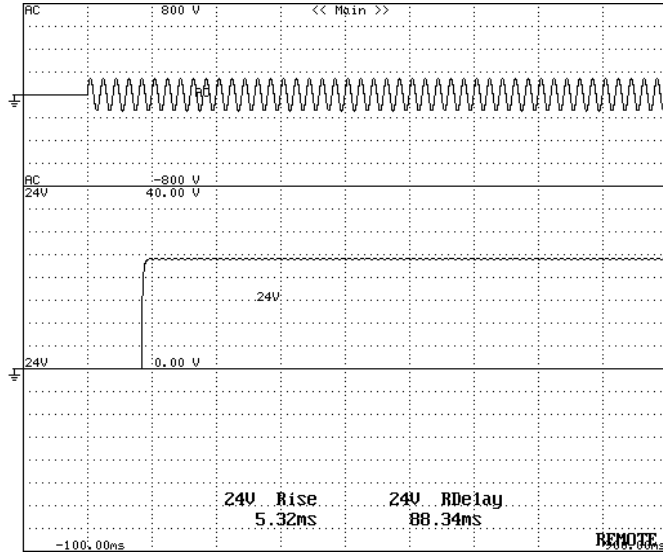


Model	UZF-220-24	Temperature: 25°C
Item	Output Rise Characteristics (at AC Power ON)	

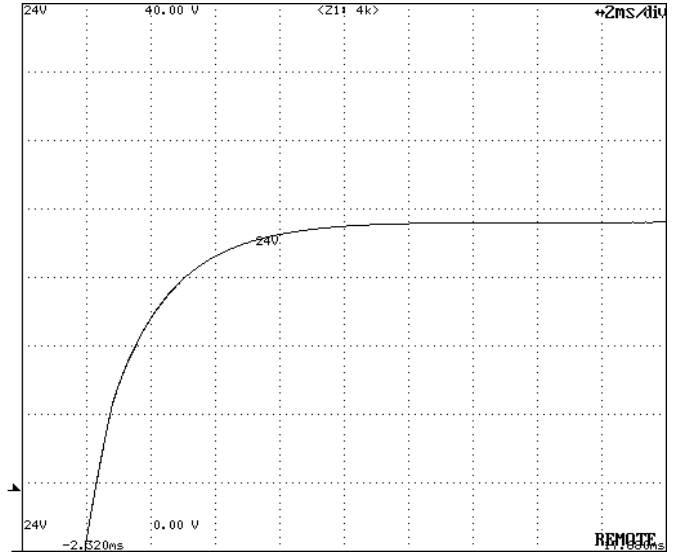
Input: 100V AC  
Load: Rated Load

Timebase Range: 100ms/div

Vertical Sensitivity: 5V/div  
Timebase Range: 2ms/div



All Output Start-up Sequence

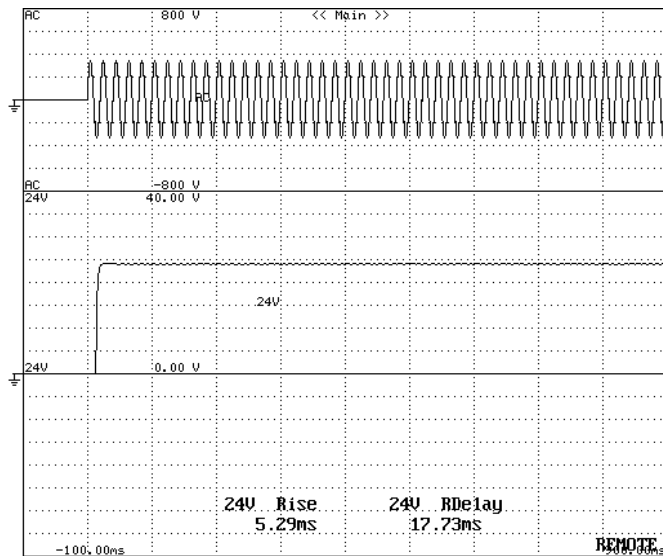


24V DC Output Rise Characteristics

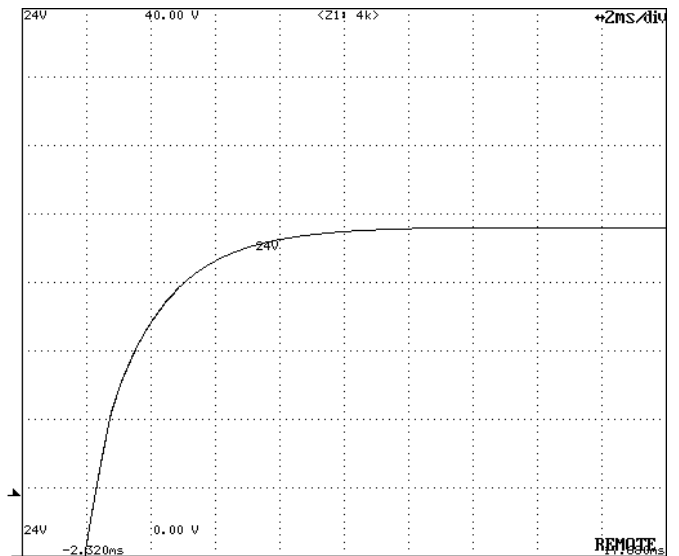
Input: 240V AC  
Load: Rated Load

Timebase Range: 100ms/div

Vertical Sensitivity: 5V/div  
Timebase Range: 2ms/div



All Output Start-up Sequence



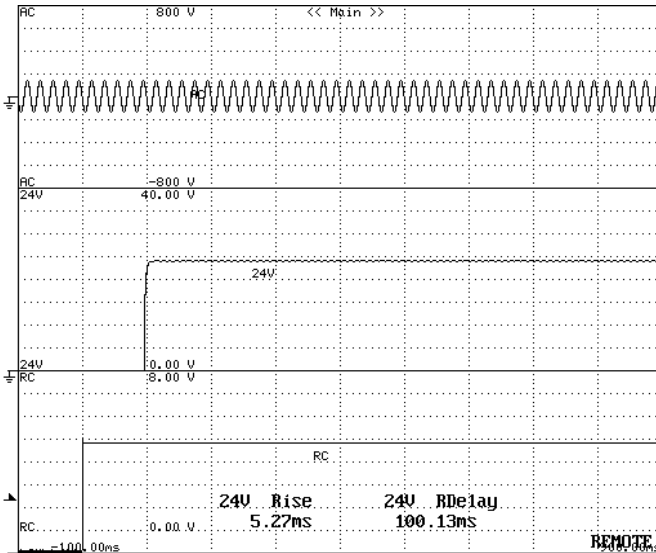
24V DC Output Rise Characteristics

Model	UZP-220-24	Temperature: 25°C
Item	Output Rise Characteristics (at Remote ON)	

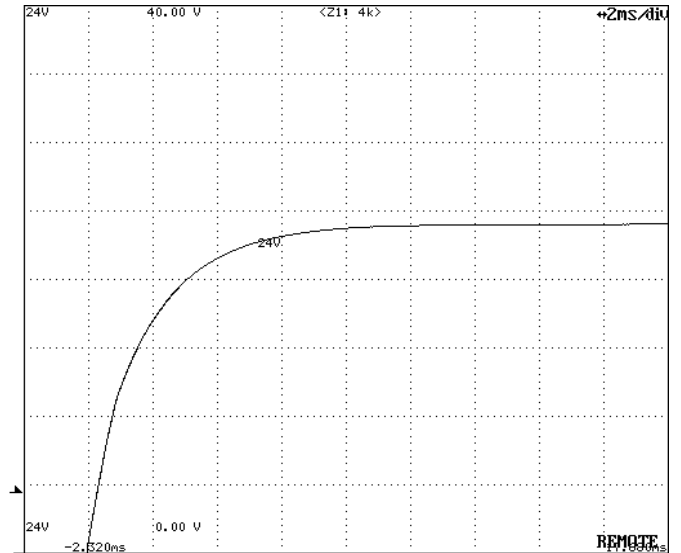
Input: 100V AC  
Load: Rated Load

Timebase Range: 100ms/div

Vertical Sensitivity: 5V/div  
Timebase Range: 2ms/div



All Output Start-up Sequence

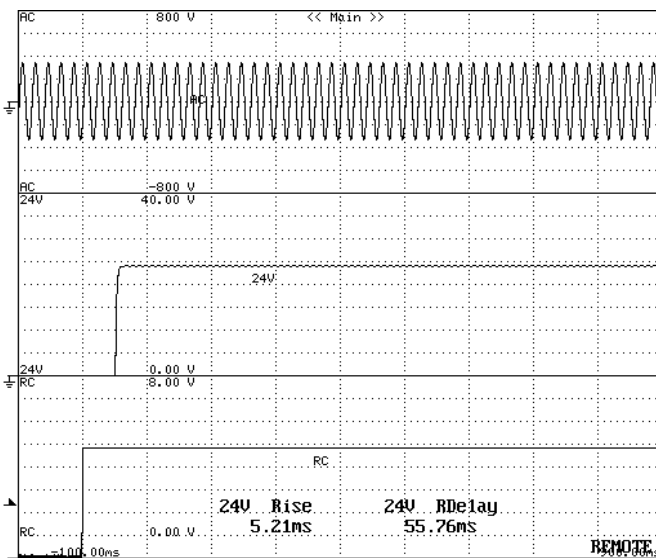


24V DC Output Rise Characteristics

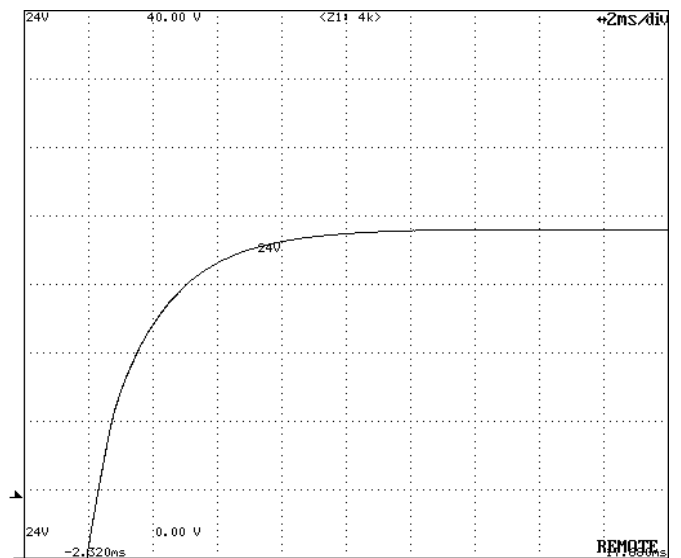
Input: 240V AC  
Load: Rated Load

Timebase Range: 100ms/div

Vertical Sensitivity: 5V/div  
Timebase Range: 2ms/div



All Output Start-up Sequence

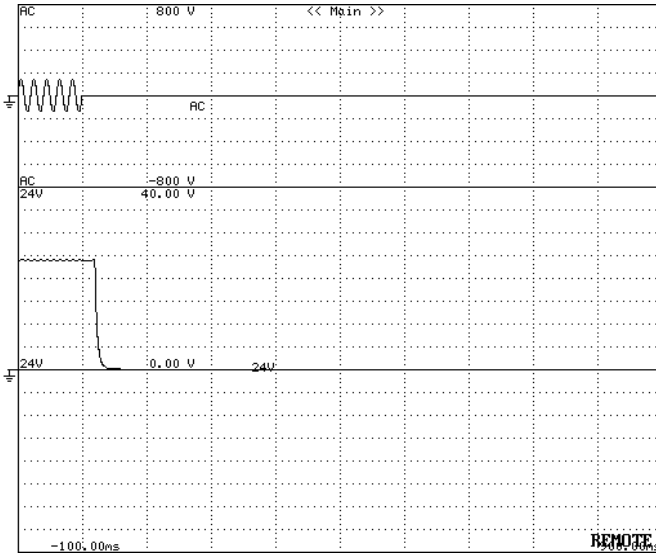


24V DC Output Rise Characteristics

Model	UZP-220-24	Temperature: 25°C
Item	Output Fall Characteristics (at AC Power OFF)	

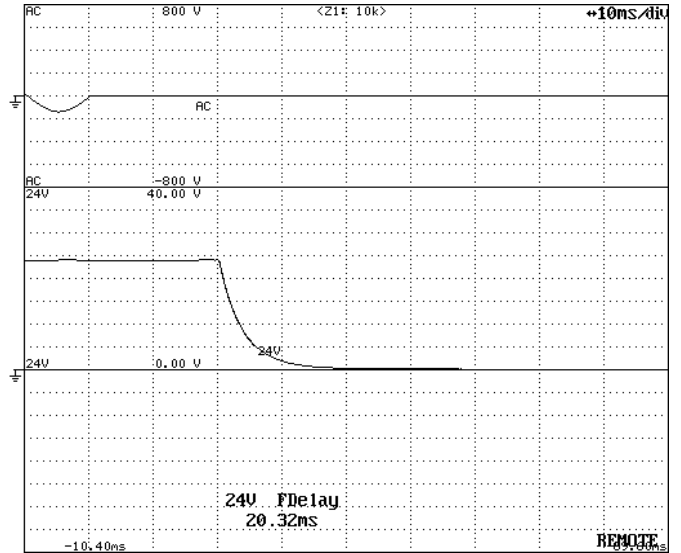
Input: 100V AC  
Load: Rated Load

Timebase Range: 100ms/div



Output Fall Characteristics

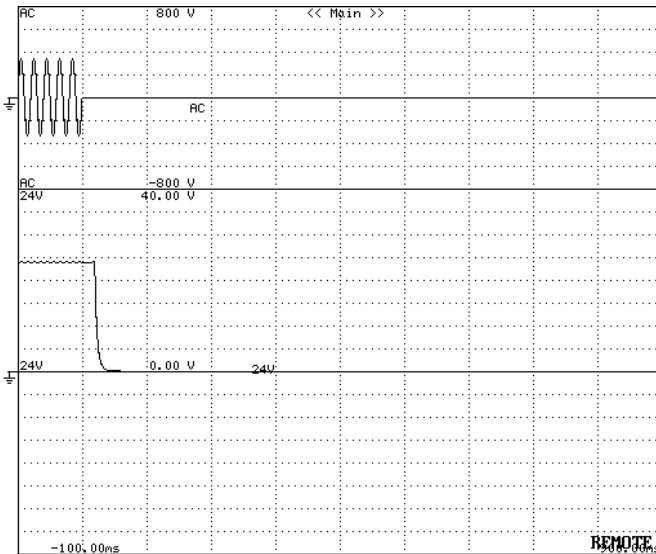
Timebase Range: 10ms/div



Output Fall Characteristics (magnification)

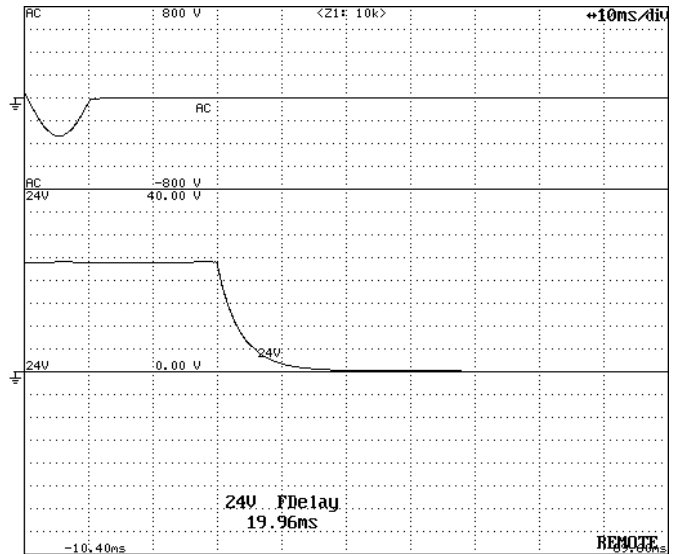
Input: 240V AC  
Load: Rated Load

Timebase Range: 100ms/div



Output Fall Characteristics

Timebase Range: 10ms/div

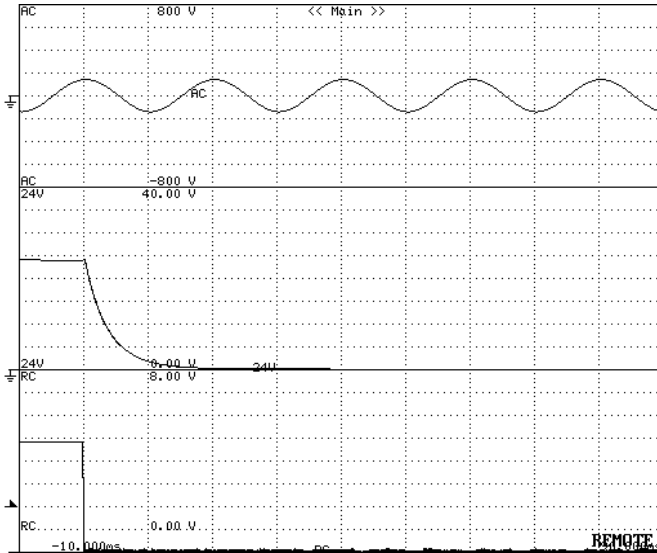


Output Fall Characteristics (magnification)

Model	UZP-220-24	Temperature: 25°C
Item	Output Fall Characteristics (at Remote OFF)	

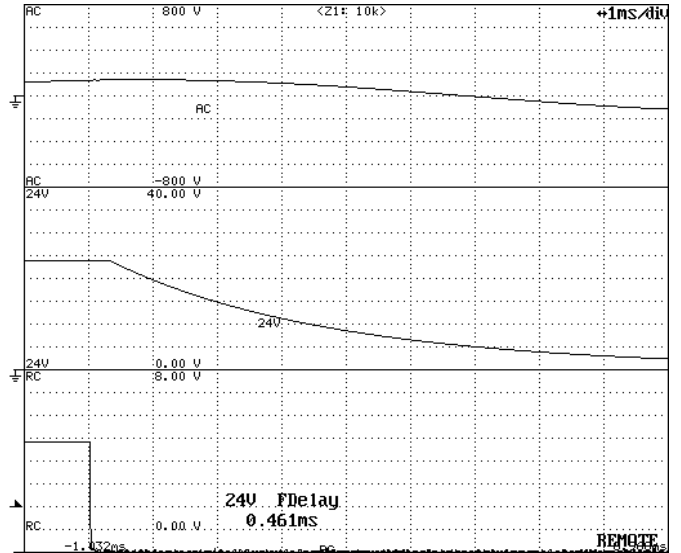
Input: 100V AC  
Load: Rated Load

Timebase Range: 10ms/div



Output Fall Characteristics

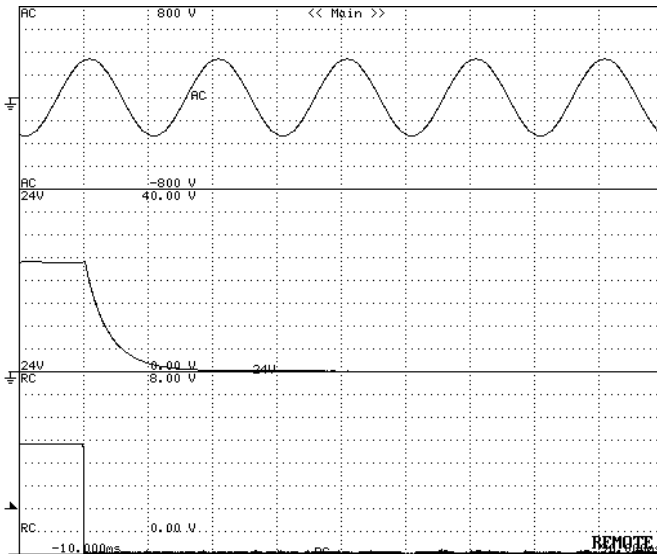
Timebase Range: 1ms/div



Output Fall Characteristics (magnification)

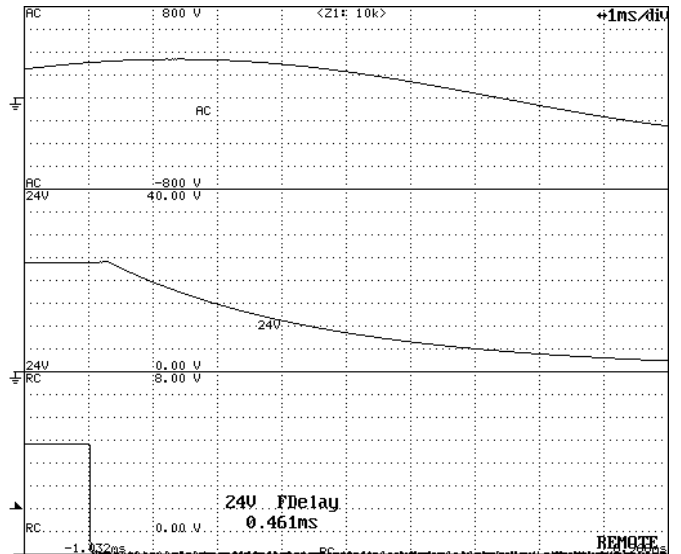
Input: 240V AC  
Load: Rated Load

Timebase Range: 10ms/div



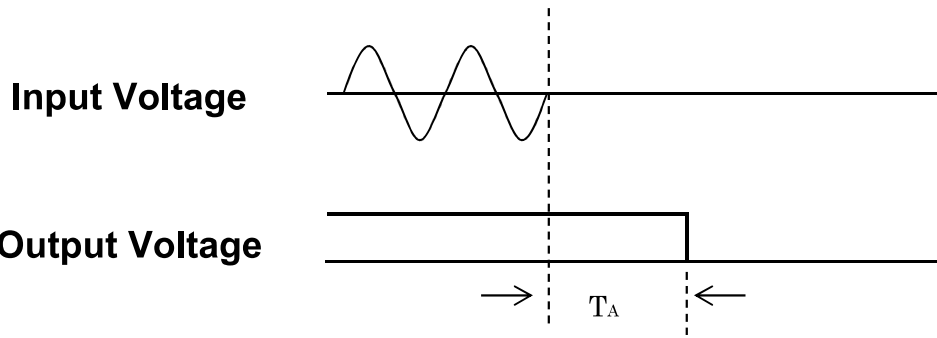
Output Fall Characteristics

Timebase Range: 1ms/div

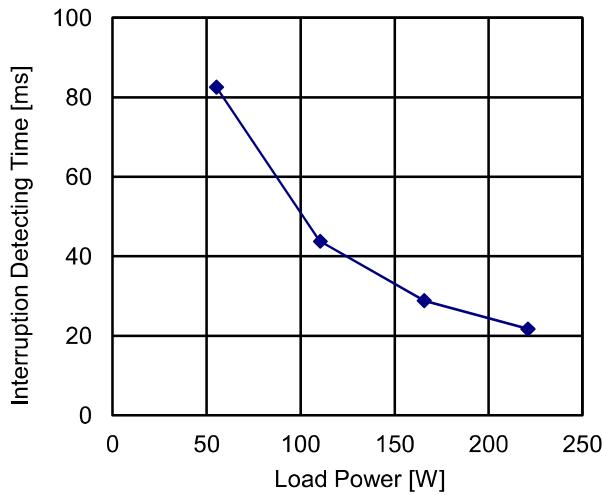


Output Fall Characteristics (magnification)

Model	UZP-220-24	Temperature: 25°C
Item	Instantaneous Interruption Compensation (by Load Power)	

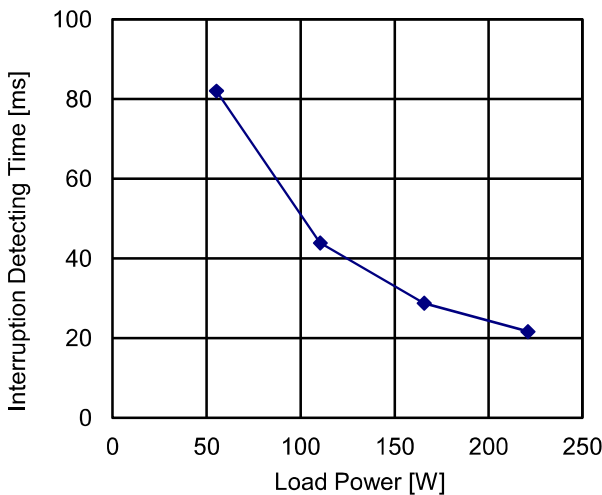


### Input Voltage:100V AC



Load Power [W]	Interruption Detecting Time [ms]
	Ouput Voltage
	$T_A$
55.20	82.7
110.4	43.8
165.60	28.9
220.8	21.8

### Input Voltage:240V AC

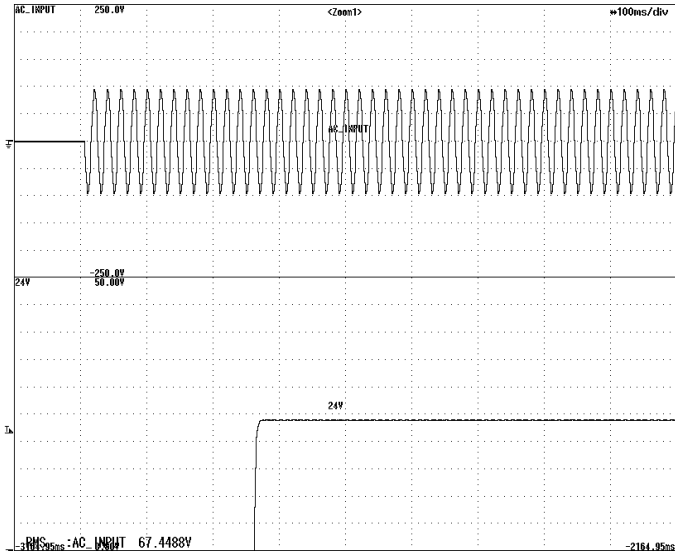


Load Power [W]	Interruption Detecting Time [ms]
	Ouput Voltage
	$T_A$
55.20	82.1
110.4	43.9
165.60	28.8
220.8	21.7

Model	UZP-220-24	Temperature: 25°C
Item	Start-Up Voltage	

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

**AC Input**

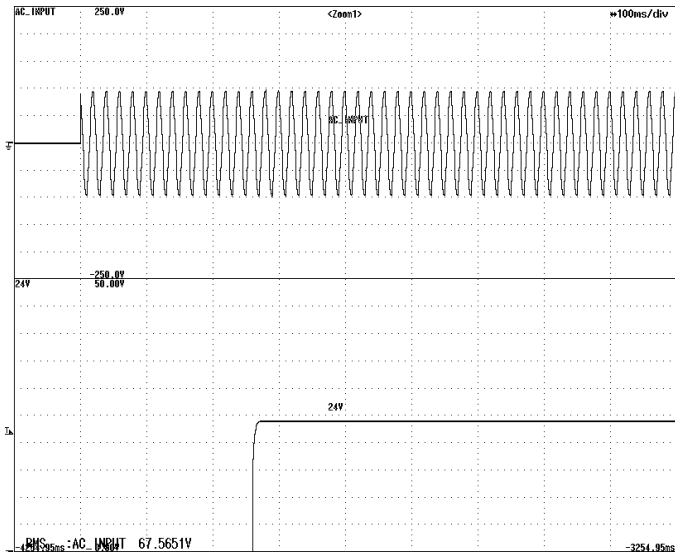


**+24V**

**Start-up Voltage: 67.4V AC**

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

**AC Input**

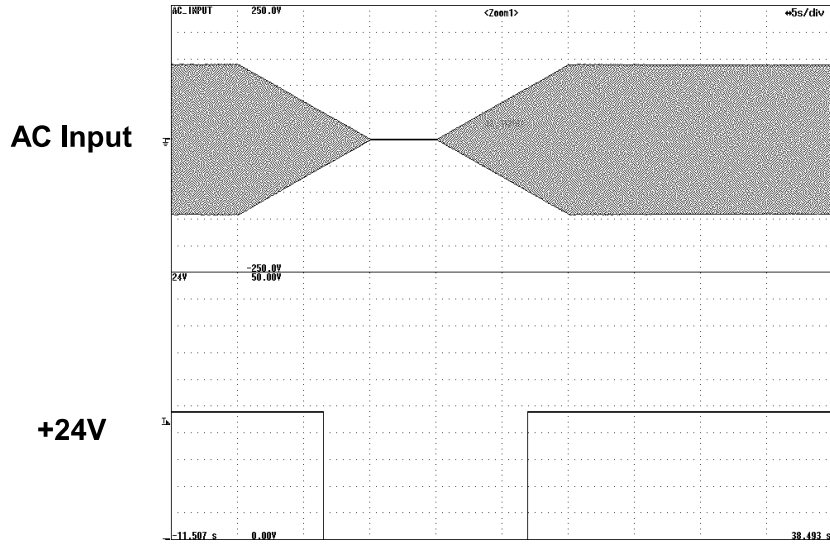


**+24V**

**Start-up Voltage: 67.6V AC**

Model	UZP-220-24	Temperature: 25°C
Item	Input Voltage Sweep Up/Down	

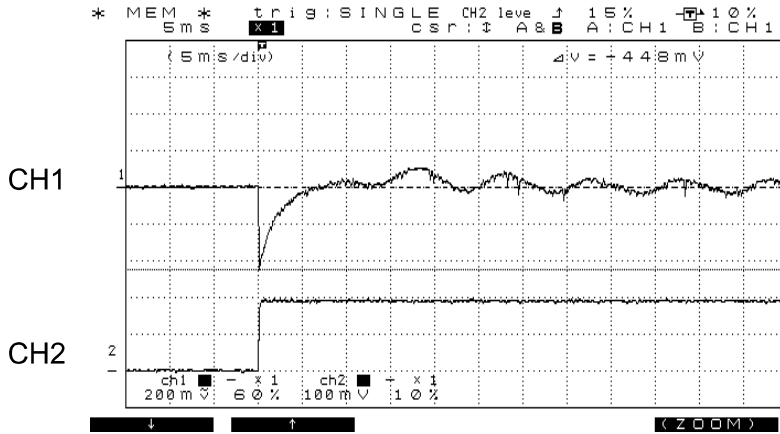
**Timebase Range: 5s/div  
Load: Rated Load**



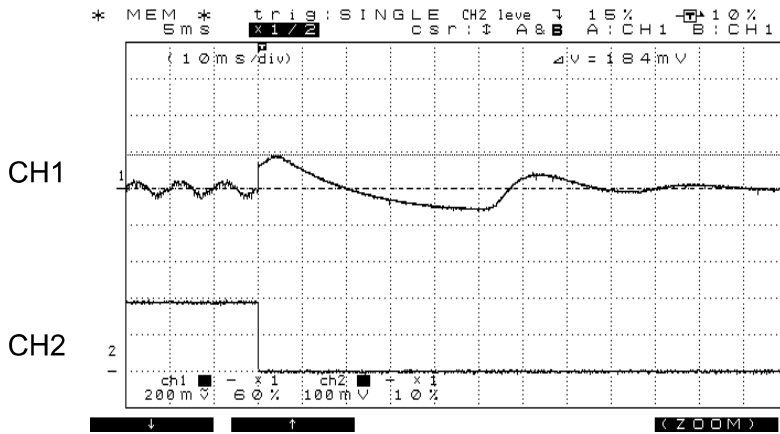
**Sweep Rate: 10Vave/sec**

Model	UZP-220-24	Temperature: 25°C
Item	Dynamic Load Response	

## +24V DC Output Transient Response Waveforms



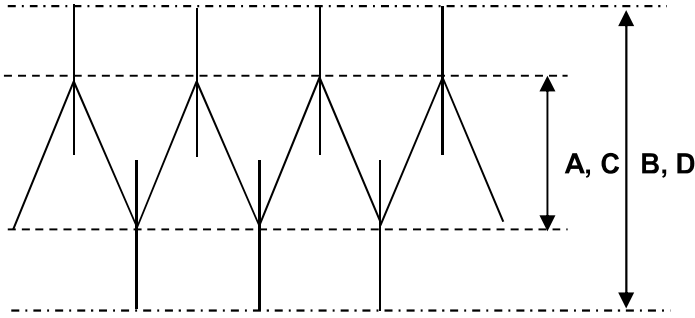
Waveform 1	
CH1	Measuring Point: DC Output Voltage
	Vertical Sensitivity: 200mV/div
CH2	Measuring Point: DC Output Current
	Vertical Sensitivity: 5A/div
Timebase Range	5ms/div
Condition	Input: 100V AC
Note: Minimum load(0A) → Rated Load(9.2A)	



Waveform 2	
CH1	Measuring Point: DC Output Voltage
	Vertical Sensitivity: 200mV/div
CH2	Measuring Point: DC Output Current
	Vertical Sensitivity: 5A/div
Timebase Range	10ms/div
Condition	Input: 100V AC
Note: Rated Load(9.2A) → Minimum load(0A)	



Model	UZP-220-24	Load: Rated Load
Item	Ripple / Noise Voltage	



**at 100V AC**

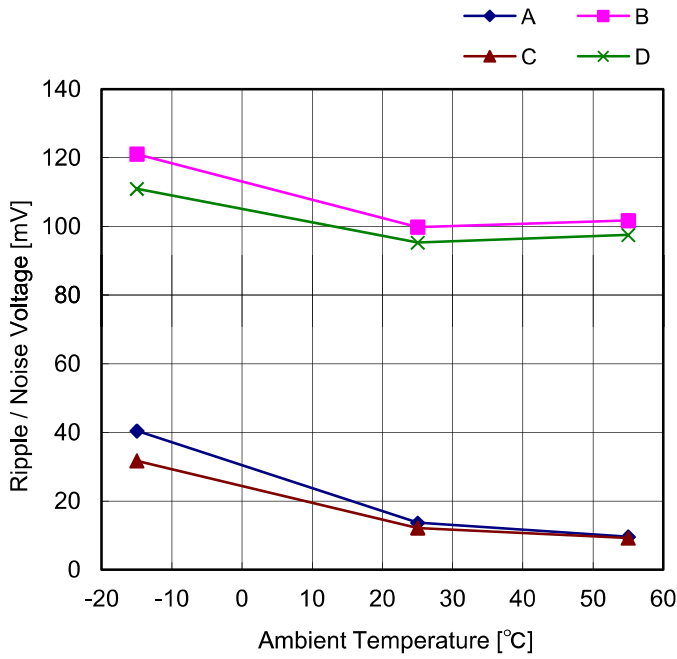
A: Ripple Voltage ( $mV_{P-P}$ )

B: Noise Voltage ( $mV_{P-P}$ )

**at 240V AC**

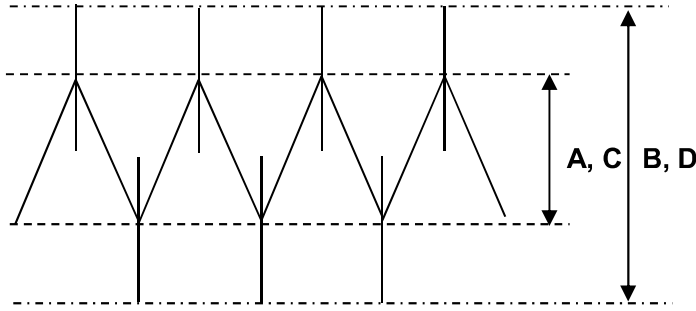
C: Ripple Voltage ( $mV_{P-P}$ )

D: Noise Voltage ( $mV_{P-P}$ )



Ambient Temp. [°C]	Ripple / Noise Voltage [mV]			
	A	B	C	D
-15	40.4	121.0	31.7	110.9
25	13.6	99.8	12.1	95.3
55	9.5	101.7	9.2	97.5

Model	UZP-220-24	Temperature : 25°C
Item	Ripple / Noise Voltage	

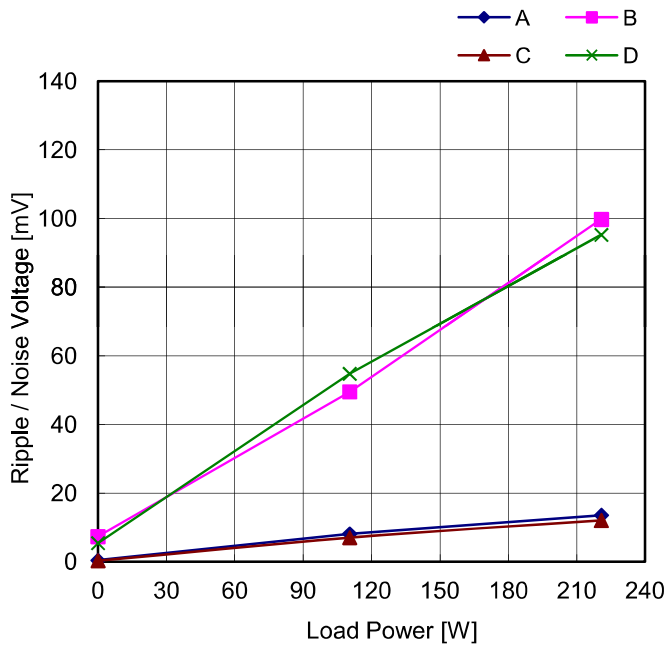


**at 100V AC**

A: Ripple Voltage (mVP-P)  
B: Noise Voltage (mVP-P)

**at 240V AC**

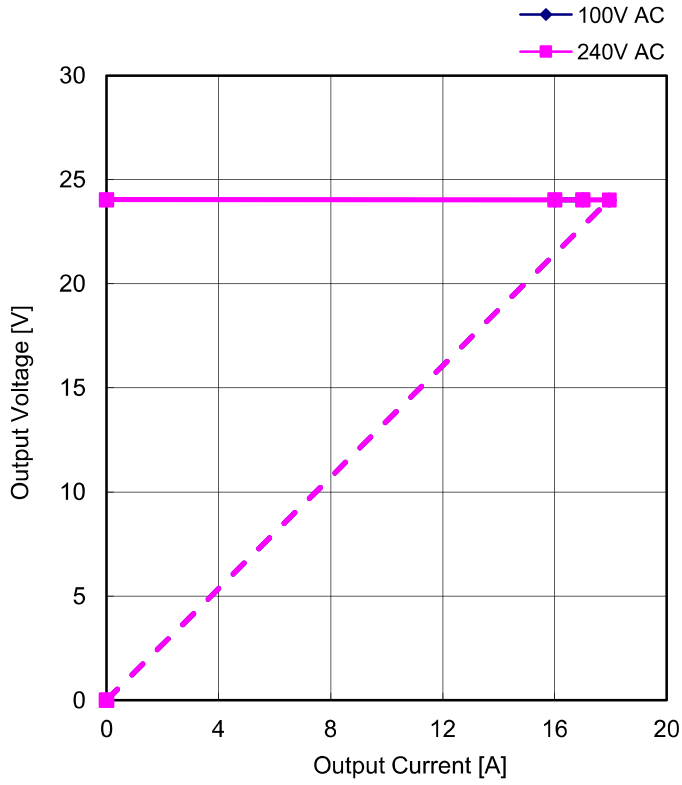
C: Ripple Voltage (mVP-P)  
D: Noise Voltage (mVP-P)



Load Power [W]	Ripple / Noise Voltage [mV]			
	A	B	C	D
0	0.4	7.3	0.3	5.4
110.4	8.1	49.5	7.0	54.8
220.8	13.6	99.8	12.1	95.3

Model	UZP-220-24	Temperature: 25°C
Item	Over-Current Protection	

## V-I Characteristics of 24V 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	24.04	0.00	24.04
16.00	24.02	16.00	24.02
17.00	24.03	17.00	24.03
17.95	24.02	17.95	24.02

Model	UZP-220-24	Load: Minimum Load
Item	Over-Voltage Protection	

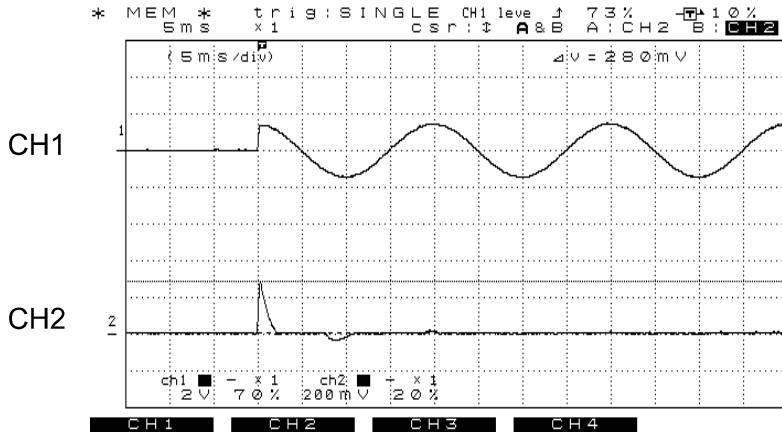
  

The graph plots Output Voltage [V] on the y-axis (ranging from 20.0 to 40.0) against Ambient Temperature [°C] on the x-axis (ranging from -20 to 80). Two data series are shown: 100V AC (blue line with diamond markers) and 240V AC (magenta line with square markers). Both series show a linear increase in output voltage as ambient temperature rises. The 240V AC series has data points at -15, 25, 55, and 75°C, with values of 31.15, 32.17, 32.85, and 33.30 V respectively. The 100V AC series is not clearly distinguishable from the 240V AC series in the graph.

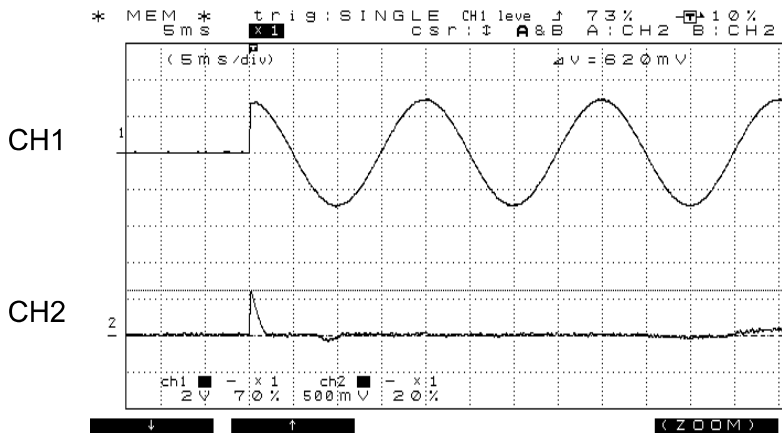
Ambient Temp. [°C]	Output Voltage [V]	
	100V AC	240V AC
-15	31.15	31.15
25	32.17	32.11
55	32.85	32.85
75	33.32	33.30

Model	UZP-220-24	Temperature: 25°C
Item	Inrush Current	Load: Rated Load

## 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
Condition	Input: 100V AC Load: Rated Load
Note: Inrush Current: 14.0A	



Waveform 2	
CH1	Measuring Point: AC Input Voltage
	Range: 200V/div
CH2	Measuring Point: AC Input Current
	Range: 25A/div
Timebase Range	5ms/div
Condition	Input: 200V AC Load: Rated Load
Note: Inrush Current: 31.0A	

Model	UZP-220-24	Load: Rated Load																		
Item	Leakage Current																			
<p>The graph plots Leakage Current [mA] on the y-axis (0 to 1) against AC Input Voltage [V] on the x-axis (50 to 300). The data points show a linear increase in leakage current as the input voltage increases.</p>		<table border="1"> <thead> <tr> <th>AC Input Voltage [V]</th> <th>Leakage Current [mA]</th> </tr> </thead> <tbody> <tr> <td>85</td> <td>0.04</td> </tr> <tr> <td>100</td> <td>0.05</td> </tr> <tr> <td>132</td> <td>0.07</td> </tr> <tr> <td>176</td> <td>0.09</td> </tr> <tr> <td>200</td> <td>0.11</td> </tr> <tr> <td>220</td> <td>0.12</td> </tr> <tr> <td>240</td> <td>0.13</td> </tr> <tr> <td>264</td> <td>0.14</td> </tr> </tbody> </table>	AC Input Voltage [V]	Leakage Current [mA]	85	0.04	100	0.05	132	0.07	176	0.09	200	0.11	220	0.12	240	0.13	264	0.14
AC Input Voltage [V]	Leakage Current [mA]																			
85	0.04																			
100	0.05																			
132	0.07																			
176	0.09																			
200	0.11																			
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