



# TEST DATA OF PBA1500T-24

Regulated DC Power Supply  
Apr. 24. 2007

Approved by : Yoshiaki Shimizu Design Manager  
Yoshiaki Shimizu

Prepared by : Yousuke Murata Design Engineer  
Yousuke Murata

COSEL CO.,LTD.



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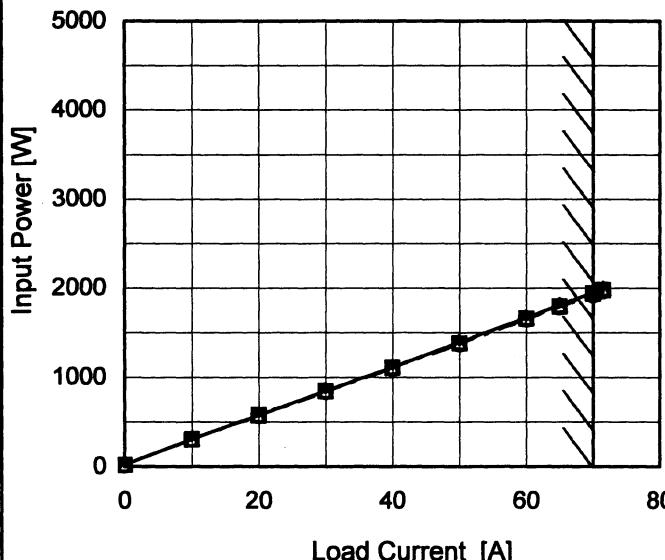
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Model	PBA1500T-24	Input Temperature Testing Circuitry	AC 3-phase 25°C Figure A																																																	
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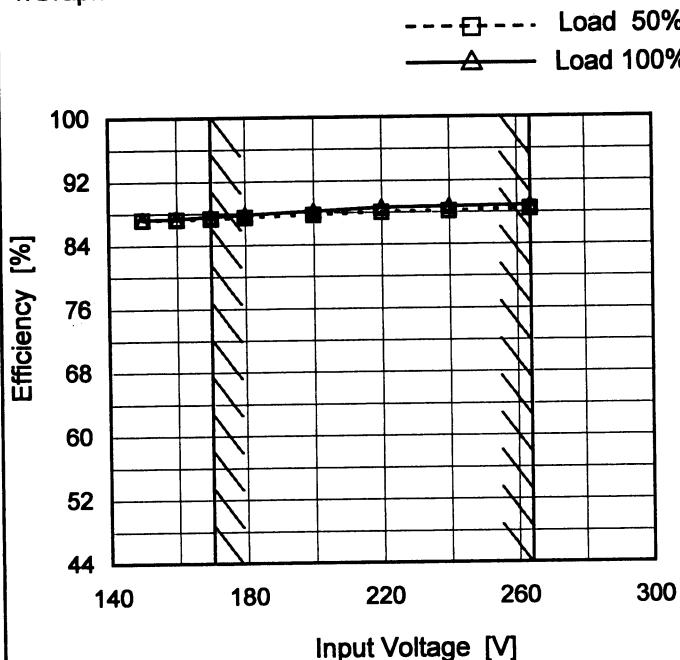
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Model	PBA1500T-24
Item	Efficiency (by Input Voltage)
Object	—

## 1. Graph



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

Input AC 3-phase  
Temperature 25°C  
Testing Circuitry Figure A

## 2. Values

Input Voltage [V]	Efficiency [%]	
	Load 50%	Load 100%
150	87.2	87.2
160	87.2	87.3
170	87.3	87.6
180	87.4	87.8
200	87.7	88.2
220	88.0	88.6
240	88.1	88.7
264	88.4	88.8
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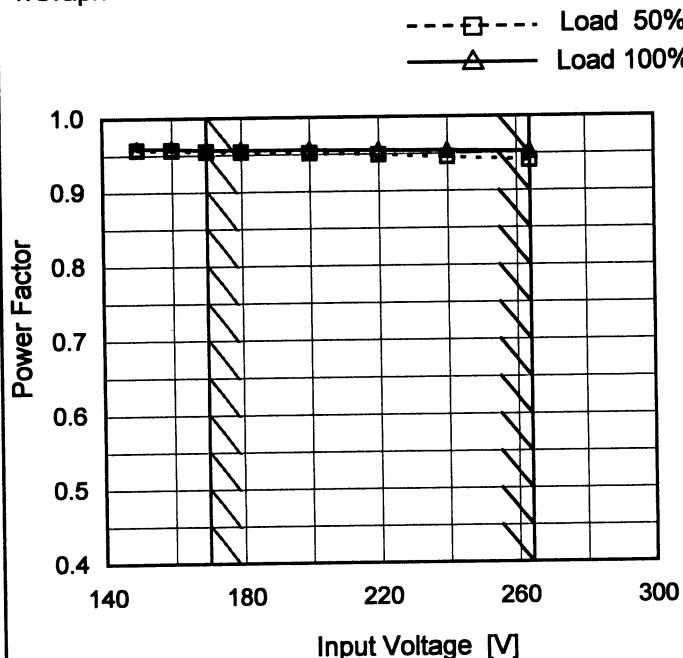
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Model	PBA1500T-24
Item	Power Factor (by Input Voltage)
Object	—

## 1. Graph



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

Input AC 3-phase  
Temperature 25°C  
Testing Circuitry Figure A

## 2. Values

Input Voltage [V]	Power Factor	
	Load 50%	Load 100%
150	0.957	0.958
160	0.957	0.958
170	0.954	0.957
180	0.953	0.957
200	0.951	0.956
220	0.949	0.955
240	0.945	0.954
264	0.940	0.952
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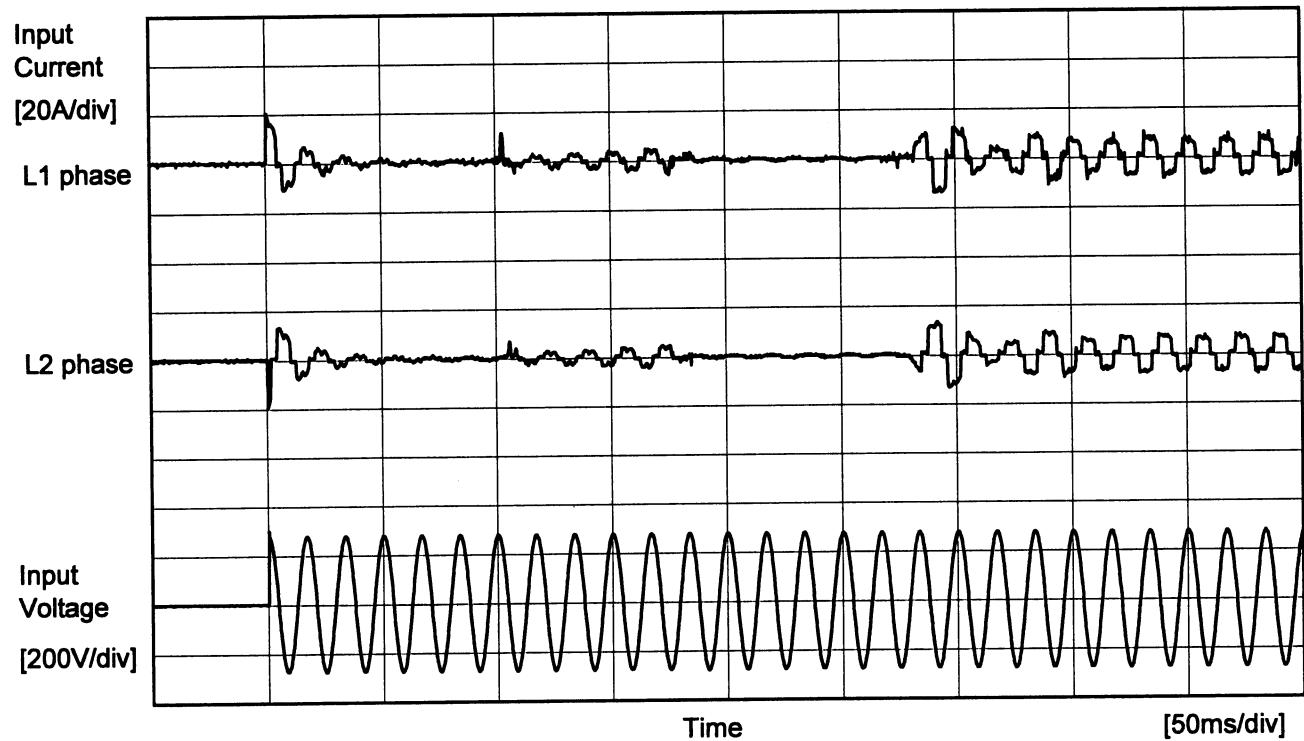
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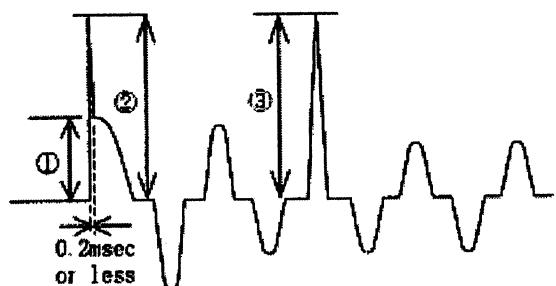
Note: Slanted line shows the range of the rated load current.

coSEL

Model	PBA1500T-24	Input Temperature Testing Circuitry	AC 3-phase 25°C Figure A
Item	Inrush Current		
Object	—		



Input Voltage	200 V
Frequency	60 Hz
Load	100 %
Inrush Current	
①	18.0 A
②	20.8 A (0.2ms or less)*1
③	15.6 A



\*1 The specification of the inrush current (primary surge) means that the surge current to a built-in noise filter (0.2ms or less : waveform②) is excluded



Model	PBA1500T-24	Input	AC 3-phase
Item	Leakage Current	Temperature	25°C
Object	_____	Testing Circuitry	Figure B

### 1. Results

Standards	Leakage Current [mA]		
	Input Volt. 85 [V]	Input Volt. 100 [V]	Input Volt. 132 [V]
(A)DEN-AN	—	—	—
(B)IEC60950	—	—	—

Standards	Leakage Current [mA]		
	Input Volt. 170 [V]	Input Volt. 240 [V]	Input Volt. 264 [V]
(B)IEC60950	0.77	1.12	1.25

### 2. Condition

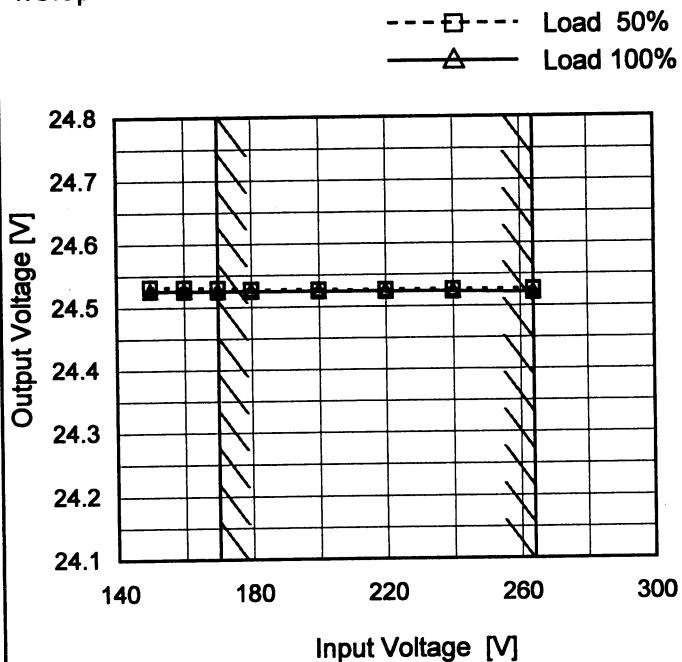
Leakage current value is concluded after measuring both phases of AC input and by choosing the larger one.

**COSEL**

Model	PBA1500T-24
Item	Line Regulation
Object	+24V70A

Input AC 3-phase  
 Temperature 25°C  
 Testing Circuitry Figure A

## 1. Graph



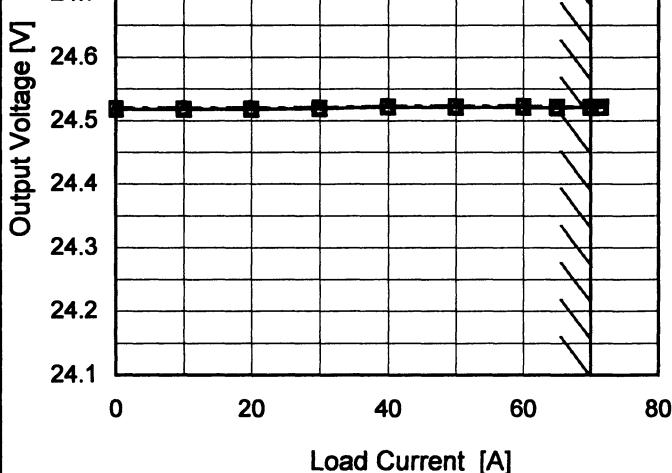
Note: Slanted line shows the range of the rated input voltage.

## 2. Values

Input Voltage [V]	Output Voltage [V]	
	Load 50%	Load 100%
150	24.531	24.526
160	24.530	24.525
170	24.529	24.525
180	24.527	24.525
200	24.527	24.524
220	24.526	24.524
240	24.526	24.523
264	24.526	24.521
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**COSEL**

Model	PBA1500T-24	Input Temperature Testing Circuitry	AC 3-phase 25°C <sup>1</sup> Figure A																																														
Item	Load Regulation																																																
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1.Graph	<p>—△— Input Volt. 170 V</p> <p>- - □ - - Input Volt. 200 V</p> <p>- - ○ - - Input Volt. 264 V</p> <table border="1"> <caption>Data points estimated from Graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>Output Voltage [V] (170V Input)</th> <th>Output Voltage [V] (200V Input)</th> <th>Output Voltage [V] (264V Input)</th> </tr> </thead> <tbody> <tr><td>0</td><td>24.518</td><td>24.519</td><td>24.519</td></tr> <tr><td>10.0</td><td>24.518</td><td>24.519</td><td>24.520</td></tr> <tr><td>20.0</td><td>24.517</td><td>24.518</td><td>24.519</td></tr> <tr><td>30.0</td><td>24.518</td><td>24.520</td><td>24.520</td></tr> <tr><td>40.0</td><td>24.521</td><td>24.522</td><td>24.522</td></tr> <tr><td>50.0</td><td>24.521</td><td>24.522</td><td>24.523</td></tr> <tr><td>60.0</td><td>24.521</td><td>24.522</td><td>24.523</td></tr> <tr><td>65.0</td><td>24.520</td><td>24.521</td><td>24.522</td></tr> <tr><td>70.0</td><td>24.520</td><td>24.521</td><td>24.521</td></tr> <tr><td>71.5</td><td>24.521</td><td>24.521</td><td>24.522</td></tr> <tr><td>--</td><td>--</td><td>--</td><td>--</td></tr> </tbody> </table>	Load Current [A]	Output Voltage [V] (170V Input)	Output Voltage [V] (200V Input)	Output Voltage [V] (264V Input)	0	24.518	24.519	24.519	10.0	24.518	24.519	24.520	20.0	24.517	24.518	24.519	30.0	24.518	24.520	24.520	40.0	24.521	24.522	24.522	50.0	24.521	24.522	24.523	60.0	24.521	24.522	24.523	65.0	24.520	24.521	24.522	70.0	24.520	24.521	24.521	71.5	24.521	24.521	24.522	--	--	--	--
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70.0	24.520	24.521	24.521
71.5	24.521	24.521	24.522
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# COSEL

Model	PBA1500T-24
Item	Dynamic Load Response
Object	+24V70A

Input AC 3-phase  
Temperature 25°C  
Testing Circuitry Figure A

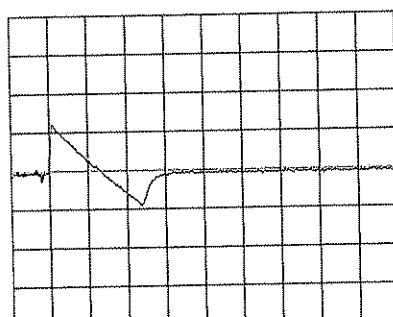
Input Volt. 200 V  
Cycle 1000 ms



Min.Load (0A) ↔  
Load 100% (70A)

100mV/div

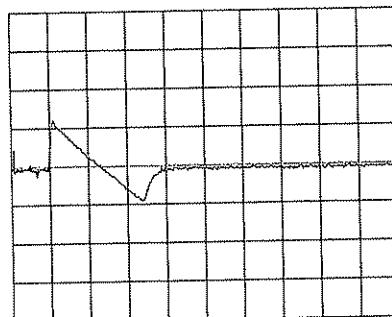
10ms/div



Min.Load (0A) ↔  
Load 50% (35A)

100mV/div

10ms/div



**COSEL**

Model	PBA1500T-24	Input Temperature Testing Circuitry	AC 3-phase 25°C <sup>1</sup> Figure A																																						
Item	Ripple Voltage (by Load Current)																																								
Object	+24V70A																																								
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<p>Measured by 20MHz Oscilloscope.      Ripple Voltage is shown as p-p in the figure below.      Note: Slanted line shows the range of the rated load current.</p> <p>T1: Due to AC Input Line      T2: Due to Switching</p> <p>Fig. Complex Ripple Wave Form</p>																																									

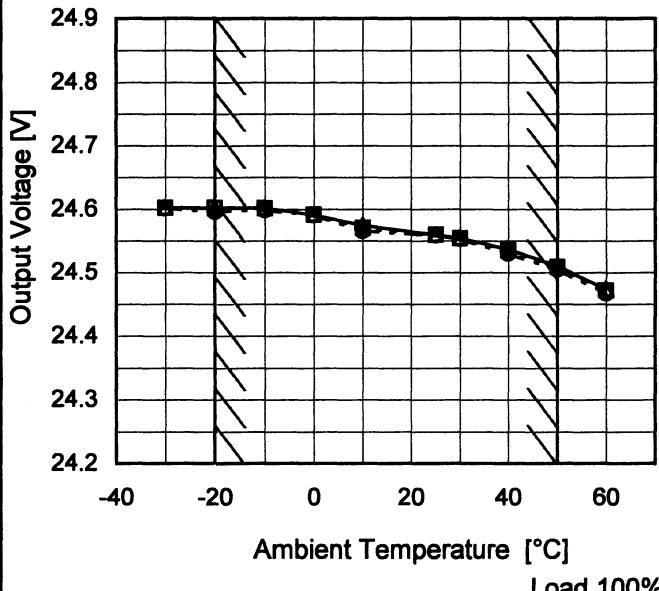
**COSEL**

Model	PBA1500T-24	Input Temperature Testing Circuitry	AC 3-phase 25°C <sup>1</sup> Figure A																																			
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Object	+24V70A																																					
1. Graph			2. Values																																			
<p>Graph showing Ripple-Noise [mV] vs Load Current [A]. The Y-axis ranges from 0 to 200 mV, and the X-axis ranges from 0 to 80 A. Two curves are plotted: one for Input Volt. 200 V (solid line with triangles) and one for Input Volt. 240 V (dashed line with circles). Both curves show an increase in noise with load current, with a slight dip around 70A. A slanted line indicates the rated load current range from 65A to 71.5A.</p> <table border="1"> <thead> <tr> <th>Load Current [A]</th> <th>Ripple-Noise [mV] (200V)</th> <th>Ripple-Noise [mV] (240V)</th> </tr> </thead> <tbody> <tr><td>0</td><td>20</td><td>20</td></tr> <tr><td>10.0</td><td>20</td><td>20</td></tr> <tr><td>20.0</td><td>30</td><td>30</td></tr> <tr><td>30.0</td><td>30</td><td>30</td></tr> <tr><td>40.0</td><td>40</td><td>40</td></tr> <tr><td>50.0</td><td>50</td><td>50</td></tr> <tr><td>60.0</td><td>50</td><td>50</td></tr> <tr><td>65.0</td><td>50</td><td>50</td></tr> <tr><td>70.0</td><td>60</td><td>60</td></tr> <tr><td>71.5</td><td>60</td><td>60</td></tr> <tr><td>-</td><td>--</td><td>--</td></tr> </tbody> </table>			Load Current [A]	Ripple-Noise [mV] (200V)	Ripple-Noise [mV] (240V)	0	20	20	10.0	20	20	20.0	30	30	30.0	30	30	40.0	40	40	50.0	50	50	60.0	50	50	65.0	50	50	70.0	60	60	71.5	60	60	-	--	--
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**COSEL**

<p><b>Model</b> PBA1500T-24</p> <p><b>Item</b> Ripple Voltage (by Ambient Temp.)</p> <p><b>Object</b> +24V70A</p>	<p>Input AC 3-phase Testing Circuitry Figure A</p>																																					
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**COSEL**

Model	PBA1500T-24	Input Testing Circuitry AC 3-phase Figure A																																																			
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Object	+24V70A																																																				
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25	24.560	24.560	24.558																																																		
30	24.555	24.554	24.553																																																		
40	24.537	24.535	24.530																																																		
50	24.511	24.509	24.505																																																		
60	24.474	24.472	24.467																																																		
--	--	--	--																																																		



Model	PBA1500T-24	Input Testing Circuitry AC 3-phase Figure A
Item	Output Voltage Accuracy	
Object	+24V70A	

### 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 : 170 – 264V

Load Current : 0 – 70A

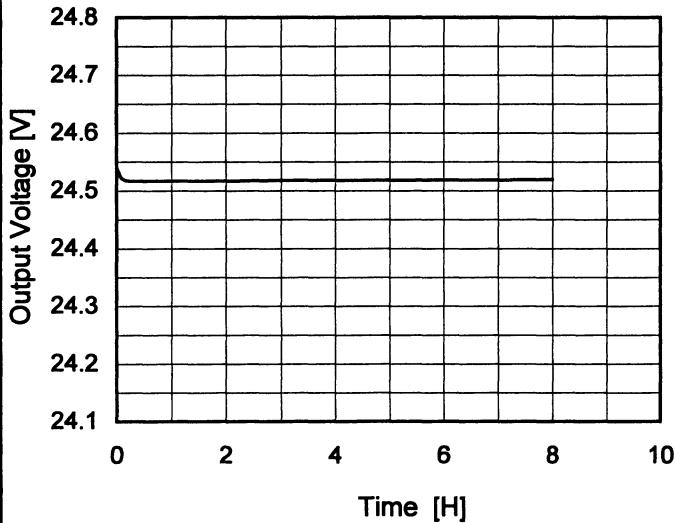
\* Output Voltage Accuracy =  $\pm(\text{Maximum of Output Voltage} - \text{Minimum of Output Voltage}) / 2$

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

### 2. Values

Item	Temperature [°C]	Input Voltage [V]	Output		Output Voltage Accuracy	
			Current[A]	Voltage[V]	Value [mV]	Ration [%]
Maximum Voltage	-20	200	70	24.600	$\pm 59$	$\pm 0.2$
Minimum Voltage	50	170	0	24.482		

**COSEL**

Model	PBA1500T-24	Input Temperature Testing Circuitry	AC 3-phase 25°C Figure A																						
Item	Time Lapse Drift																								
Object	+24V70A																								
1.Graph			2.Values																						
 <p>Output Voltage [V]</p> <p>Time [H]</p> <p>Input Volt. 200V Load 100%</p>			<table border="1"> <thead> <tr> <th>Time since start [H]</th> <th>Output Voltage [V]</th> </tr> </thead> <tbody> <tr><td>0.0</td><td>24.541</td></tr> <tr><td>0.5</td><td>24.516</td></tr> <tr><td>1.0</td><td>24.517</td></tr> <tr><td>2.0</td><td>24.517</td></tr> <tr><td>3.0</td><td>24.518</td></tr> <tr><td>4.0</td><td>24.518</td></tr> <tr><td>5.0</td><td>24.518</td></tr> <tr><td>6.0</td><td>24.518</td></tr> <tr><td>7.0</td><td>24.519</td></tr> <tr><td>8.0</td><td>24.519</td></tr> </tbody> </table>	Time since start [H]	Output Voltage [V]	0.0	24.541	0.5	24.516	1.0	24.517	2.0	24.517	3.0	24.518	4.0	24.518	5.0	24.518	6.0	24.518	7.0	24.519	8.0	24.519
Time since start [H]	Output Voltage [V]																								
0.0	24.541																								
0.5	24.516																								
1.0	24.517																								
2.0	24.517																								
3.0	24.518																								
4.0	24.518																								
5.0	24.518																								
6.0	24.518																								
7.0	24.519																								
8.0	24.519																								

**COSEL**

Model PBA1500T-24

Item Rise and Fall Time

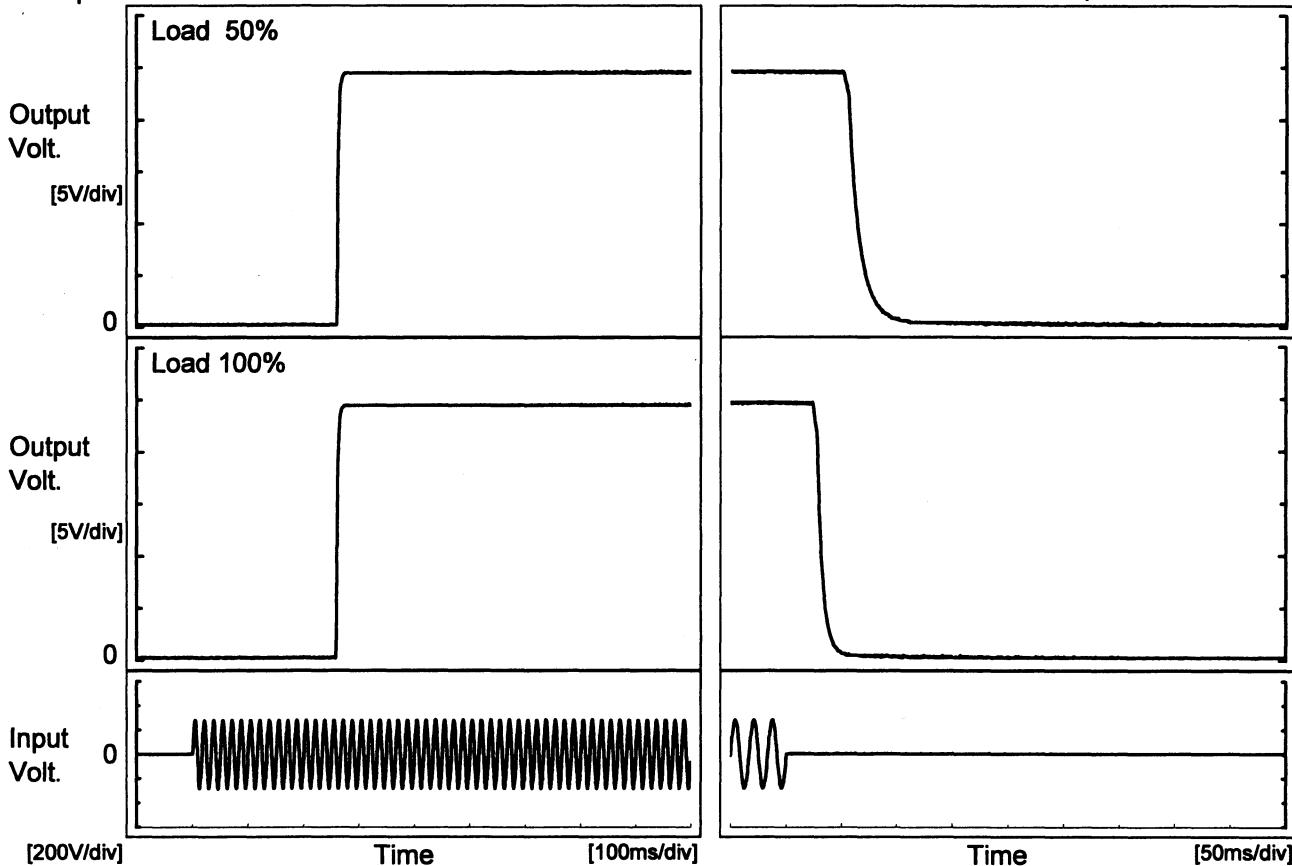
Object +24V70A

Input AC 3-phase

Temperature 25°C

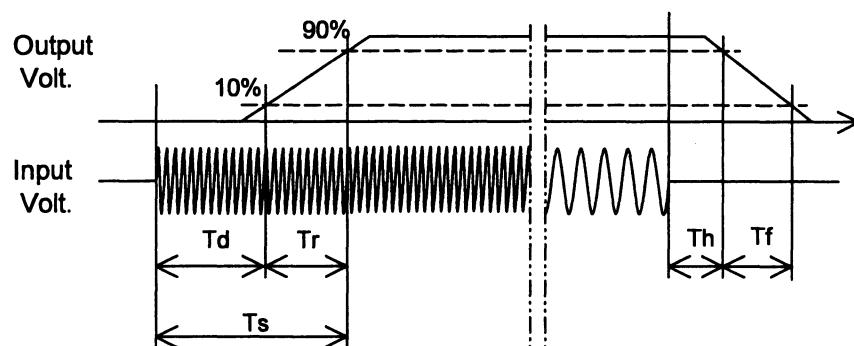
Testing Circuitry Figure A

## 1. Graph



## 2. Values

Load	Time	Td	Tr	Ts	Th	Tf
50 %		260.0	5.0	265.0	56.0	23.8
100 %		259.0	5.0	264.0	27.5	12.3



**COSEL**

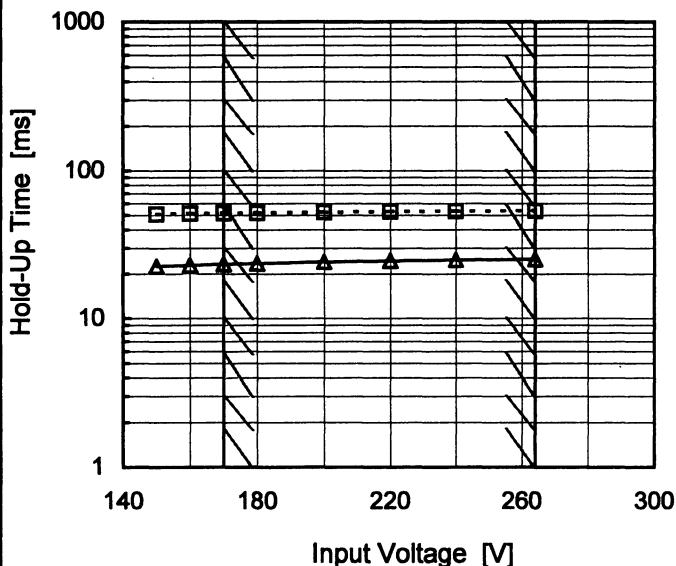
Model PBA1500T-24

Item Hold-Up Time

Object +24V70A

## 1. Graph

---□--- Load 50%  
 —△— Load 100%



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.

 Input AC 3-phase  
 Temperature 25°C  
 Testing Circuitry Figure A

## 2. Values

Input Voltage [V]	Hold-Up Time [ms]	
	Load 50%	Load 100%
150	51	23
160	51	23
170	51	23
180	52	24
200	52	24
220	53	25
240	53	25
264	53	25
—	--	--

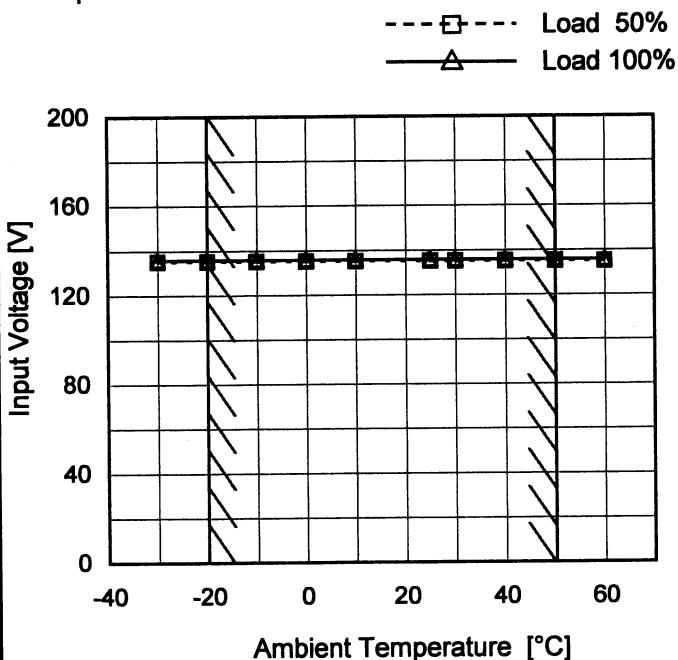
**COSEL**

Model	PBA1500T-24	Input Temperature Testing Circuitry	AC 3-phase 25°C <sup>1</sup> Figure A																																															
Item	Instantaneous Interruption Compensation																																																	
Object	+24V70A																																																	
1.Graph	<p>—△— Input Volt. 170 V      - -□--- Input Volt. 200 V      - -○--- Input Volt. 264 V</p> <table border="1"> <caption>Data points estimated from Graph</caption> <thead> <tr> <th>Load Current [A]</th> <th>170[V] [ms]</th> <th>200[V] [ms]</th> <th>264[V] [ms]</th> </tr> </thead> <tbody> <tr><td>10</td><td>180</td><td>180</td><td>180</td></tr> <tr><td>20</td><td>178</td><td>180</td><td>183</td></tr> <tr><td>30</td><td>65</td><td>93</td><td>94</td></tr> <tr><td>40</td><td>38</td><td>61</td><td>62</td></tr> <tr><td>50</td><td>37</td><td>38</td><td>46</td></tr> <tr><td>60</td><td>34</td><td>35</td><td>36</td></tr> <tr><td>70</td><td>28</td><td>28</td><td>29</td></tr> <tr><td>80</td><td>25</td><td>26</td><td>27</td></tr> <tr><td>90</td><td>23</td><td>24</td><td>25</td></tr> <tr><td>100</td><td>22</td><td>23</td><td>24</td></tr> </tbody> </table>			Load Current [A]	170[V] [ms]	200[V] [ms]	264[V] [ms]	10	180	180	180	20	178	180	183	30	65	93	94	40	38	61	62	50	37	38	46	60	34	35	36	70	28	28	29	80	25	26	27	90	23	24	25	100	22	23	24			
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Note:	Slanted line shows the range of the rated load current.																																																	

**COSEL**
**Model** PBA1500T-24

**Item** Minimum Input Voltage  
for Regulated Output Voltage

**Object** +24V70A

**1. Graph**


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

**Input AC 3-phase Testing Circuitry Figure A**
**2. Values**

Ambient Temperature [°C]	Input Voltage [V]	
	Load 50%	Load 100%
-30	135	136
-20	135	136
-10	135	136
0	135	136
10	135	136
25	135	136
30	135	136
40	135	136
50	135	136
60	135	136
--	--	--

# COSEL

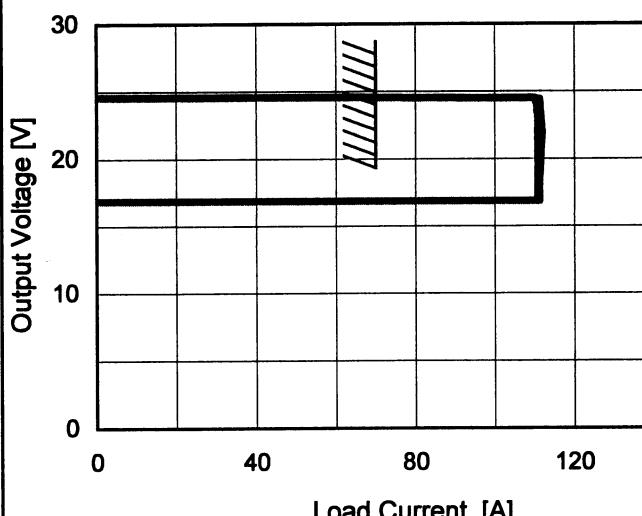
Model PBA1500T-24

Item Overcurrent Protection

Object +24V70A

1.Graph

— Input Volt. 170 V  
 — Input Volt. 200 V  
 — Input Volt. 264 V



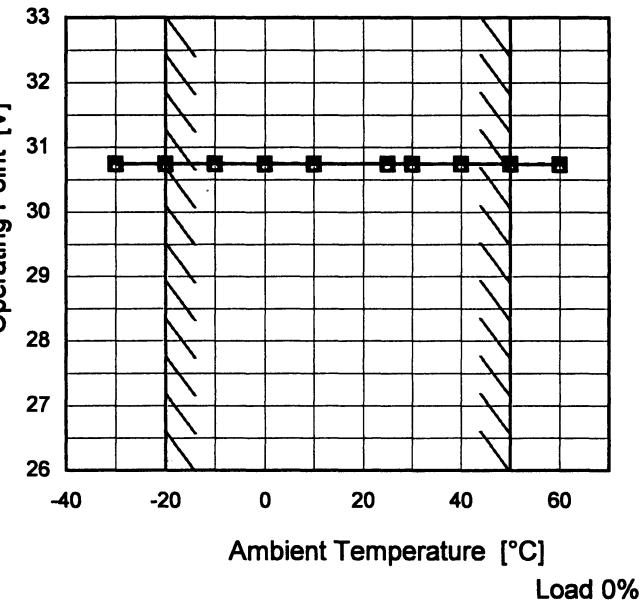
Note: Slanted line shows the range of the rated load current.

Input AC 3-phase  
 Temperature 25°C  
 Testing Circuitry Figure A

2.Values

Output Voltage [V]	Load Current [A]		
	Input Volt. 170[V]	Input Volt. 200[V]	Input Volt. 264[V]
24.0	111.53	110.73	110.45
22.8	111.97	111.24	110.98
21.6	112.12	111.29	110.92
19.2	111.74	111.22	111.02
16.8	111.39	111.24	110.81
14.4	0.00	0.00	0.00
12.0	0.00	0.00	0.00
9.6	0.00	0.00	0.00
7.2	0.00	0.00	0.00
4.8	0.00	0.00	0.00
2.4	0.00	0.00	0.00
0.0	0.00	0.00	0.00

**COSEL**

<p><b>Model</b> PBA1500T-24</p> <p><b>Item</b> Overvoltage Protection</p> <p><b>Object</b> +24V70A</p>	Input AC 3-phase Testing Circuitry Figure A																																																				
	<b>1.Graph</b> <ul style="list-style-type: none"> <li>— △ — Input Volt. 170 V</li> <li>--- □ --- Input Volt. 200 V</li> <li>- - - ○ - - Input Volt. 264 V</li> </ul>  <p>Operating Point [V]</p> <p>Ambient Temperature [°C]</p> <p>Load 0%</p>																																																				
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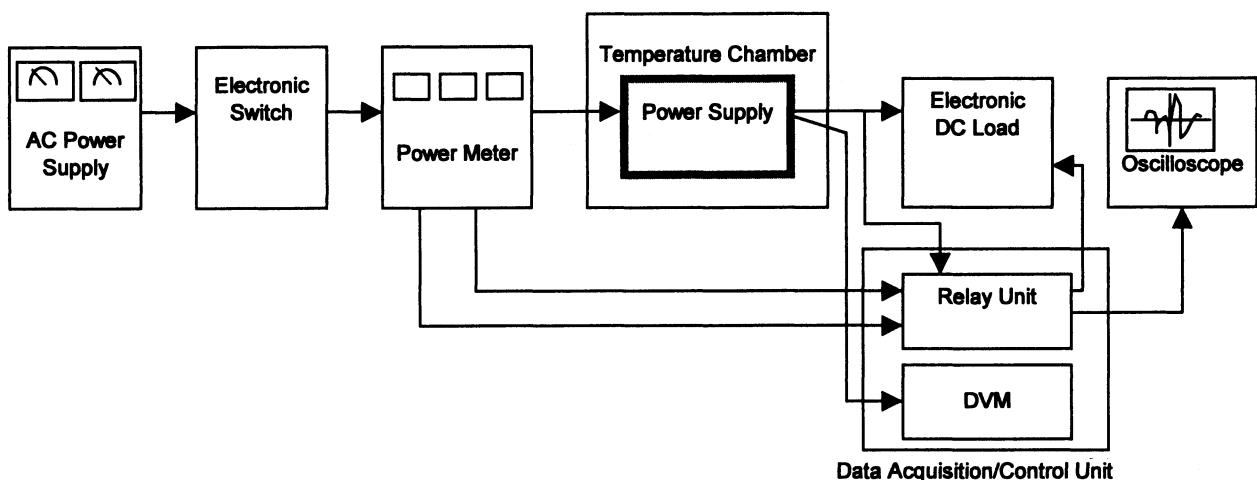


Figure A

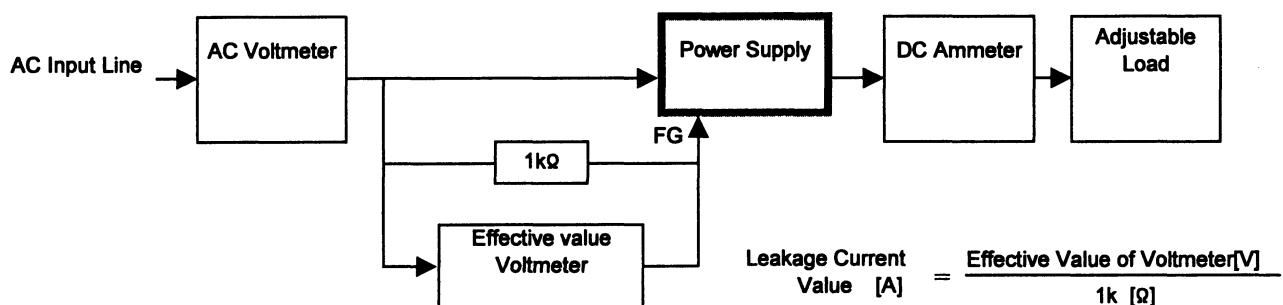


Figure B ( DEN-AN )

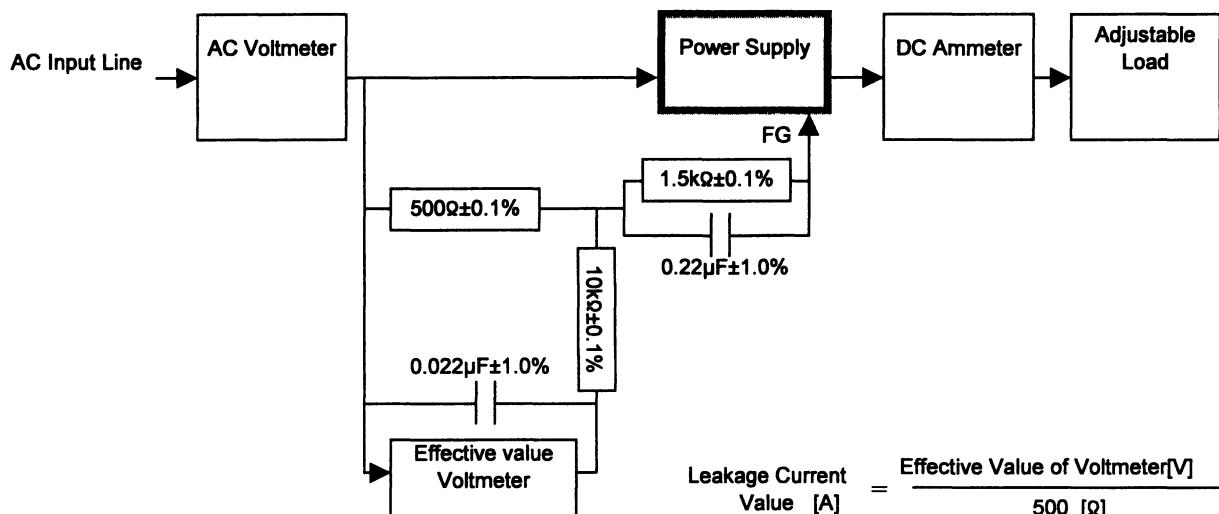


Figure B ( IEC60950 )