



# Specification for Approval

**Customer** : 株式会社アコン

**Part Name** : AC Adapter

**Description** : 24.0 Volts / 18.75 Amps

**Model No.** : ATM450A2-P240 (Level VI)

**Customer P / N** :

**Product P / N** :

**Issued Date** : 16 – May – 2023

**Version** : 01

**Issued Stamp** :

**Customer's approval signature**

**ADAPTER TECHNOLOGY CO.,LTD.**

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**Factory (China) : BOAYANG ELECTRONICS CO., LTD.**



**450.0 W  
AC Adapter  
SPECIFICATION**

**Model No.** : **ATM450A2-P240 (Level VI)**

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**Description** : **24.0 Volts / 18.75 Amps**

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**Version** : **01**

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<b>Approved</b>	<b>Reviewed</b>	<b>Checked</b>	<b>Prepared</b>	<b>Sales</b>



# Adapter Technology Co., Ltd.

## ■ Approval documents / spec. revised records

■ Customer : 株式会社アコン

■ Model no : ATM450A2-P240

■ Original documents content : Spec. 11 pages , Attachment 0 pages

Revised Records : No.	Date	Description ( Before / After )	Page(s) Revised	Revised By (Adapter/Customer)	Version
1	May/16/2023	Issue	-	Satoshi	01



## 1. Feature :

- ◆ **Input** : Universal 100 ~ 240 Vac / 50 ~ 60 Hz Input, without any slide switch.
- ◆ **Output** : +24.0 V / 0 ~ 18.75 A
- ◆ **Case Dimension** : 254.0 (L) \* 116.0 (W) \*47.0 (H) mm ± 1 mm
- ◆ **Efficiency** : Eff<sub>(av)</sub> ≥ 88 %  
Eff ≥ 75 % @ 10 % load
- ◆ **Safety** : UL / cUL / GS / BSMI / PSE / UKCA
- ◆ **EMC** : CE / FCC (conduction & radiation Class B)
- ◆ **Protection** : OVP (Over Voltage Protection) 、 SCP (Short Circuit Protection) 、  
OCP (Over Current Protection) 、OTP (Over Temperature Protection)
- ◆ **High frequency and Gallium Nitride Based design, less power consumption**
- ◆ **Suitable for usage at I.T.E., industrial controller**

## 2. Input :

2.1 Voltage	Universal 100 ~ 240 Vac , single phase
2.2 Frequency	50 ~ 60 Hz
2.3 Current	5.3 A Max.
2.4 Inrush Current	150 A max. / 240 Vac (Cold start at 25 °C , full load) ( ac source chroma 6530 )
2.5 Efficiency	Eff <sub>(av)</sub> ≥ 88 % (At 115 Vac & 230 Vac) Eff ≥ 75 % @ 10 % load (At 230 Vac)
2.6 Power Consumption	Pi ≤ 0.5 W (At 115 Vac & 230 Vac & At No load)
2.7 Power Factor (PF)	Pi ≥ 0.9 (At 115 Vac & 230 Vac, At Full load)

$$\text{※Eff}_{(av)} = \frac{E_1 + E_2 + E_3 + E_4}{4}$$

$E_1$ =efficiency with 25% rated load ,  $E_2$ = efficiency with 50% rated load  
 $E_3$ =efficiency with 75% rated load ,  $E_4$ = efficiency with 100% rated load

## 3. Output :

3.1 DC Output	Voltage	+24.0 V ± 5%
	Current	18.75 A Max.
	Regulation	22.8 Vmin. ~ 24.0 Vtyp. ~ 25.2 Vmax.
	Ripple & Noise	240 mVp-p max.
	Total Power	450.0 W max.

Remark : For ripple & noise measurement, use a 20MHz bandwidth frequency oscilloscope, and add a 0.1μF multilayer Cap. and a Low ESR Electrolytic Cap. (47 μF) at output connector terminals. (At nominal line voltage, full load)



## 4. Protection :

4.1 Over Voltage Protection (OVP)	Vout * 150% max., latch off. (50% Load)
4.2 Over Current Protection(OCP)	Iout * 150% max., autorecovery.
4.3 Short Circuit Protection (SCP)	Autorecovery.
4.4 Over Temperature Protection (OTP)	Shut down.

## 5. Safety requirement :

5.1 Dielectric Strength : Cut off current 10 mA

(1)	Primary to secondary	3000 Vac (RMS) for 1 minute
(2)	Primary to Frame Ground	1770 Vac (RMS) for 1 minute
※ Secondary return isolated to FG		

5.2 Insulation resistance :

(1)	Primary to secondary	10 MΩ for 500 Vdc
(2)	Primary to Frame Ground	10 MΩ for 500 Vdc
※ Secondary return isolated to FG		

5.3 Leakage Current : Less than 0.1 mA

5.4 Grounding test : < 0.1 Ω

## 6. Operation and environment performance :

6.1 Temperature range

Operating	-20 °C ~ +40 °C
Storage	-20 °C ~ +80 °C

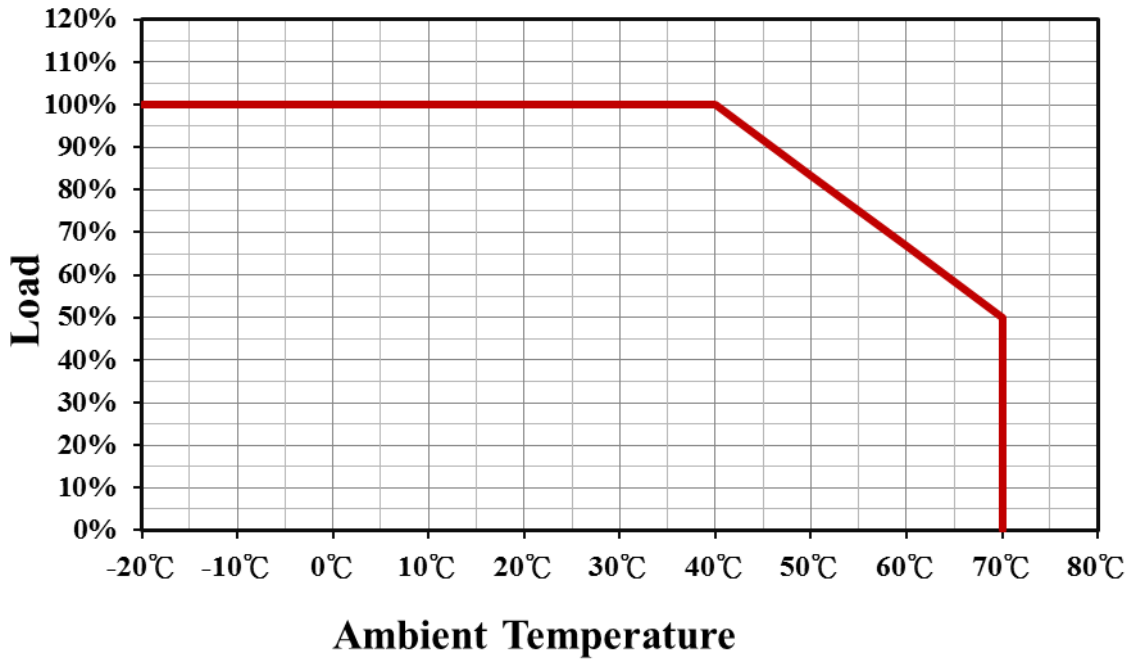
6.2 Humidity range (non-condensing)

Operating	20 % ~ 80 % RH
Storage	10 % ~ 90 % RH

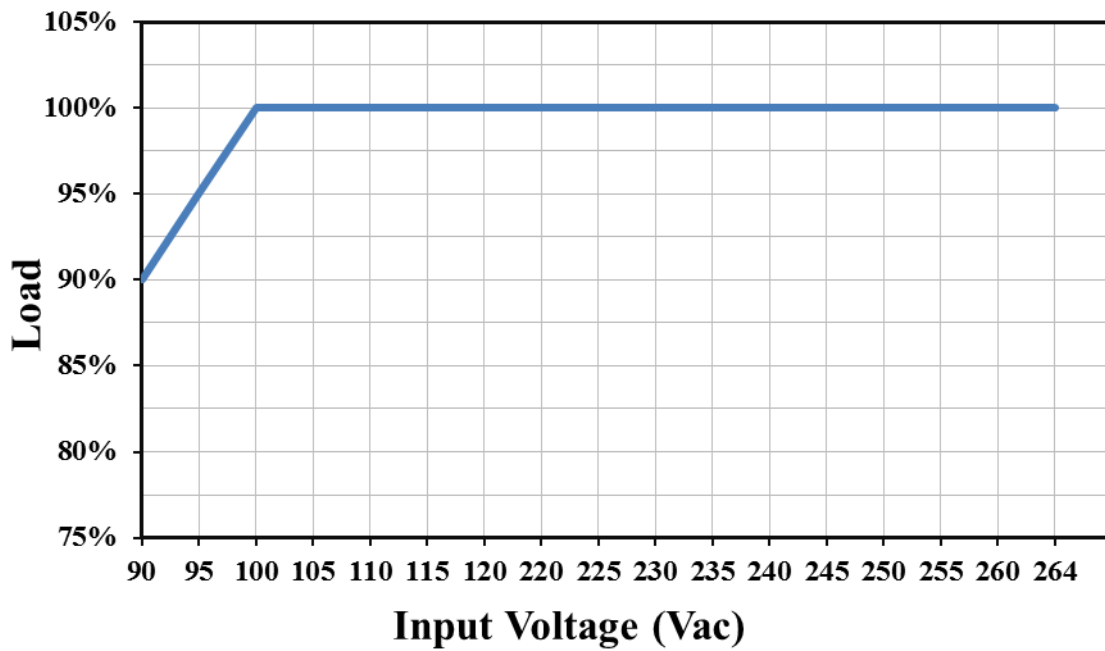
6.3 Cooling : By natural air.

7. M.T.B.F. : 300,000 Hrs.(Calculated Hours at 25 °C , By Telcordia SR-332)

## 8. Derating Curve :



## 9. Static Characteristics :



## 10. Mechanical :

10.1 Weight : 1600 g Ref.

10.2 Cable type : Black UL 2464 16AWG\* 6C  
(Wire + Housing)

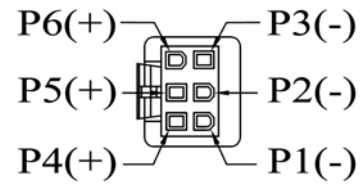
Plug : 6 PIN Housing

10.3 Cable length : 1000 m

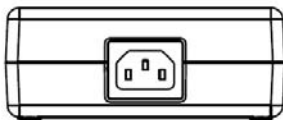
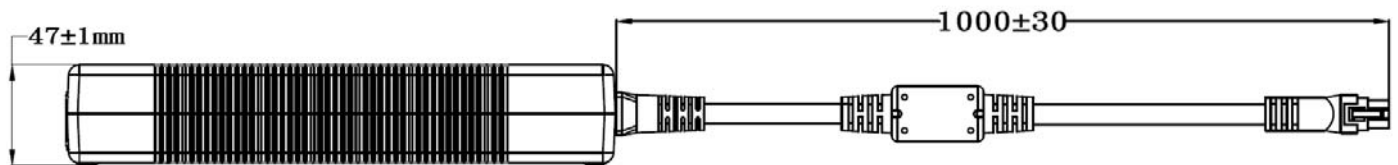
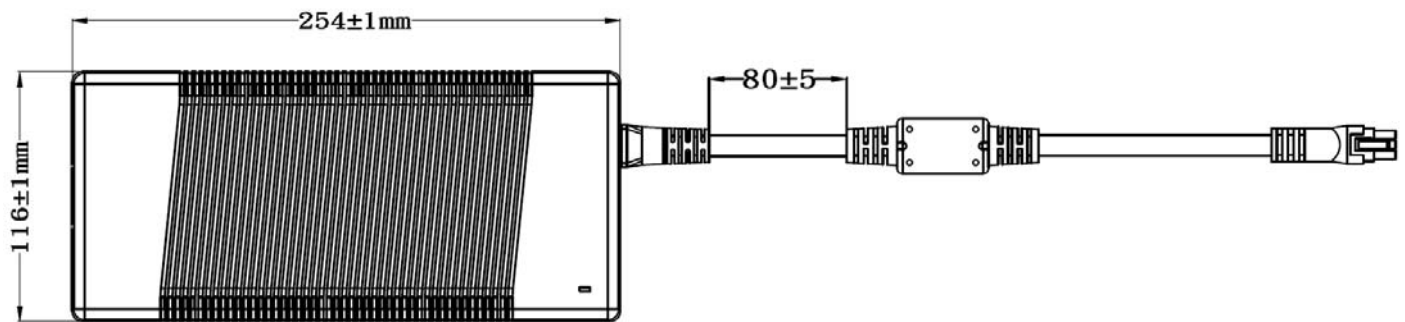
10.4 Case dimension : 254.0 (L) \* 116.0 (W) \* 47.0 (H) mm ± 1 mm

10.5 Material flammability : UL 94V-0

10.6 External appearance : As drawing below ( Scale → mm )



**Output Cable Plug Pin Assignment**



FRONT-VIEW



## 11. Label :

- 11.1 Label materials : Metalized polyester label (silver gloss)
- 11.2 Color : Black background with silver printing
- 11.3 Label dimension : 174.5 (L) \* 68.5 (W)mm ± 0.2 mm
- 11.4 Label thickness : 75 #

# 100%

## ADAPTER TECH.

**AC ADAPTER 交換式電源供應器**  
**Model (型號) : ATM450A2-P240**  
**INPUT (輸入) : 100-240V ~ 50-60Hz 5.3A**  
**OUTPUT (輸出) : 24V  $\equiv$  18.75A 450.0W**

**FC** **CE** **UK CA** **VI** **cUL US LISTED**

**TUV GS** **R33154 RoHS** **POWER SUPPLY 60JJ E225703** **RoHS**

**PS E** **JET** **株式会社アコン**

**I/P : 100-240V AC 50-60Hz 470VA-490VA 5.3A**  
**O/P : 24.0V DC 18.75A 450.0W 必ず接地接続を行って下さい。**

**FOR INDOOR USE ONLY**

For use with information technology equipment only  
 Laite on Liitettävä suojakoskettimilla varustettuun pistorasiaan  
 Apparatet må tilkobles jordet stikkontakt  
 Apparaten skall anslutas till jordat uttag  
 Apparatets stikprop skal tilsluttes en stikkontakt med jord, som giver forbindelse til stikproppens jord

D/C:2317  
 MADE IN CHINA  
 ID NO . A  
 XXX

"XXX"

Label supplier's code  
 It is accurate that the number  
 of words depends on the real  
 finished product





## A. Line Regulation Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
90 Vac / 50 % Load	22.8 V ~ 25.2 V	23.8 V		
115 Vac / 50 % Load	22.8 V ~ 25.2 V	23.8 V		
132 Vac / 50 % Load	22.8 V ~ 25.2 V	23.8 V		
180 Vac / 50 % Load	22.8 V ~ 25.2 V	23.8 V		
230 Vac / 50 % Load	22.8 V ~ 25.2 V	23.8 V		
264 Vac / 50 % Load	22.8 V ~ 25.2 V	23.8 V		

## B. Efficiency Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac	88 % Min.	91.5%		
230 Vac	88 % Min.	93.1%		
230 Vac@10 % load	75 % Min.	90.1%		

$$\text{Eff (av)} = \frac{E_1 + E_2 + E_3 + E_4}{4}$$

$E_1$ =efficiency with 25% rated load,  $E_2$ = efficiency with 50% rated load  
 $E_3$ =efficiency with 75% rated load,  $E_4$ = efficiency with 100% rated load

## C. Load Regulation Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 0 % Load	22.8 V ~ 25.2 V	24.0 V		
115 Vac / 50 % Load	22.8 V ~ 25.2 V	23.8 V		
115 Vac / 100 % Load	22.8 V ~ 25.2 V	23.6 V		
230 Vac / 0 % Load	22.8 V ~ 25.2 V	24.0 V		
230 Vac / 50 % Load	22.8 V ~ 25.2 V	23.8 V		
230 Vac / 100 % Load	22.8 V ~ 25.2 V	23.6 V		

## D. Ripple & Noise Test

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 100 % Load	240 mV Max.	115 mV		
230 Vac / 100 % Load	240 mV Max.	120 mV		



## E. Inrush Current

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
230 Vac / 100 % Load	150 A Max.	87 A		

## F. Over Voltage Protection

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 50 % Load	Vout * 150 % Max.	115%		
230 Vac / 50 % Load	Vout * 150 % Max.	115%		

## G. Over Current Protection

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 100 % Load	Iout * 180 % Max.	125%		
230 Vac / 100 % Load	Iout * 180 % Max.	125%		

## H. Short Circuit Protection

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 100 % Load	Autorecovery.	OK		
230 Vac / 100 % Load	Autorecovery.	OK		

## I. Input Power Consumption(No Load)

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 0 % Load	$\leq 0.5$ W	0.38 W		
230 Vac / 0 % Load	$\leq 0.5$ W	0.42 W		

## J. Power Factor

Test Result :

Test condition	Spec.	Reading 1	Reading 2	Reading 3
115 Vac / 100 % Load	$\geq 0.9$	0.98		
230 Vac / 100 % Load	$\geq 0.9$	0.96		



## Efficiency Test Report

- A. Model Number : ATM450A2-P240 ( 24.0 V 18.75 A 450.00 W )  
 B. DC Power Cord : UL2464 16AWG\*6C, 1.0M  
 C. Average Efficiency :  
     DoE Level VI : 88% Min.  
 D. NO Load Power Consumption :  
     DoE Level VI : 0.5W Max.  
 E. Testing Dequpment :  
     a. AC Power Source : " EXTECH " 6600  
     b. Electronic Load : " CHROMA " 63202  
     c. Power Meter : " YOKOGAWA " WT-210A  
     d. Digital Meter : " FLUKE " 45  
 F. AC Input Voltage : 115Vac/60Hz

Load Conditions Reported Quantity	100% * I <sub>0</sub>	75% * I <sub>0</sub>	50% * I <sub>0</sub>	25% * I <sub>0</sub>	10% * I <sub>0</sub>	0% * I <sub>0</sub>
	Rms Output Current(mA)	18750mA	14063mA	9375mA	4688mA	1875mA
Rms Output Voltage(V)	23.610V	23.710V	23.810V	23.900V	23.960V	24.000V
Active Output Power(W)	442.69W	333.42W	223.22W	112.03W	44.93W	0.00W
Rms Input Voltage(V)	115V	115V	115V	115V	115V	115V
Rms Input Current(A)	42.865A	3.211A	2.170A	1.168A	0.628A	0.132A
Rms Input Power(W)	485.90W	362.80W	242.00W	123.16W	50.520W	0.380W
True Power Factor (PF)	0.991	0.987	0.972	0.918	0.720	0.025
Total Harmonic Distortion of the input current	7.2A%					
Power Consumed by UUT(W)	43.213W	29.378W	18.781W	11.129W	5.595W	0.380W
Active Efficiency	91.107%	91.902%	92.239%	90.964%	88.93%	*
Average Efficiency	91.55%				88.93%	*

- G. AC Input Voltage : 230Vac/50Hz

Load Conditions Reported Quantity	100% * I <sub>0</sub>	75% * I <sub>0</sub>	50% * I <sub>0</sub>	25% * I <sub>0</sub>	10% * I <sub>0</sub>	0% * I <sub>0</sub>
	Rms Output Current(mA)	18750mA	14063mA	9375mA	4688mA	1875mA
Rms Output Voltage(V)	23.610V	23.710V	23.810V	23.900V	23.960V	24.000V
Active Output Power(W)	442.69W	333.42W	223.22W	112.03W	44.93W	0.00W
Rms Input Voltage(V)	230V	230V	230V	230V	230V	230V
Rms Input Current(A)	2.151A	1.647A	1.157A	0.660A	0.428A	0.205A
Rms Input Power(W)	476.64W	357.24W	238.71W	120.75W	49.820W	0.420W
True Power Factor (PF)	0.967	0.946	0.899	0.797	0.507	0.009
Total Harmonic Distortion of the input current	10.3A%					
Power Consumed by UUT(W)	33.953W	23.818W	15.491W	8.719W	4.895W	0.420W
Active Efficiency	92.877%	93.333%	93.510%	92.780%	90.17%	*
Average Efficiency	93.12%				90.17%	*

Tester : *Satoshi*