VP ELECTRONIQUE	**MODEL NO： KPM180M-VI 24.0V/7.5A** **ENGINEERING SPECIFICATION SHEET**

Purpose: This specification document represents the design criteria of the product identified herein, for the approval of the designated recipient (customer). Prior to production and delivery of this product by CWT, the customer shall endorse its approval of this specification document, upon review of the detailed information provided herein. The customer's endorsement (approval) verifies that the product description is determined to be fully compliant to the customer's design requirements. If one or more samples are included with this specification, the customer's endorsement (approval) further verifies that the product has been tested by the customer, for which the product satisfactorily meets all aesthetic, mechanical, electrical, and operating requirements for its intended usage with the customer's suitable indoor equipment or applications.

To Approve: An authorized employee or agent of the customer shall endorse approval of this specification. Please sign & date this cover-page, and initial each subsequent page in the lower left corner to signify all sections have been read and found to be acceptable. A completed, original copy (signed, dated, initialed) of this specification must be returned to CWT to record the approved customer design. The customer shall keep one or more copies for its records. Upon receipt, CWT shall manufacture the product to the approved customer design. If design revisions are otherwise required, a revised specification and/or modified samples shall be provided by CWT for the endorsement (approval) by the customer.

Approved

Customer Signed

Issued	Checked	Planned

Channel Well Technology Co., Ltd.

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SPEC. Revision History

Date	Revision No.	Change Information	
		Previous version	Current version
2016/09/20	1.0		Initial
2017/05/31	2.0	2.3.5 Over current protection Lower Limit 8.25A,Upper Limit 12.0A.	2.3.5 Over current protection Lower Limit 8.3A,Upper Limit 12.0A.
2017/07/17	3.0	2.3.6 over shoot 5%	2.3.6 over shoot 10%
2017/10/31	4.0	4.1.3 Surge Determination Level :Criteria A	4.1.3 Surge Determination Level :Criteria B
2017/12/4	5.0	/	Revise 2.1.3 & 2.3.8 & 4.1.3

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Table of Contents

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1 SCOPE

This document describes basic electrical characteristics and mechanical characteristic of 180W power adapters.

2 ELECTRICAL SPECIFICATION

2.1 INPUT REQUIREMENT

2.1.1 INPUT VOLTAGE RANGE

Industrial power supply shall operate within input specification from 90Vac to 264Vac or provide automatic switching between high line and low line input ranges. The table below shows common input voltage range.

Input Range	Minimum	Nominal	Maximum	Unit
	90 V	100V- 240V	264V	Vac Rms

Table 1 - Input Voltage Range

2.1.2 INPUT FREQUENCY RANGE

The industrial power supply shall operate within specification from 47 to 63 Hz.

2.1.3 AC INRUSH CURRENT

At 240Vac, 50Hz, 25 degrees C, cold start. It should not interrupt line fuse or cause damage to the industrial power supply either at cold or warm start.

At 100Vac, 60Hz, 25 degrees C, cold start. It should not interrupt line fuse or cause damage to the industrial power supply either at cold or warm start.

The inrush current must be limited to the extent that no damage is done to the supply under any specified line, load, and temperature conditions. The inrush current shall not cause any external protection devices (i.e. fuses) to trip.

2.1.4 INPUT CURRENT

Maximum steady state input current shall not exceed 3.5 A for any line voltage specified in 2.1.1.

2.1.5 LEAKAGE CURRENT

3.5mA maximum at 240Vac 50Hz

2.1.6 POWER FACTOR

0.90Min at 100Vac/60HZ or 240Vac/50HZ full load

2.1.7 INSULATION RESISTANCE

Insulation resistance shall be more than 20M ohm between primary and secondary.

2.1.8 LOW POWER CONSUMPTION

Vin	Load	Power consumption
240Vac/50Hz 100Vac/60Hz	0A	≤ 0.15 W

2.2 INPUT PROTECTION

2.2.1 INPUT CURRENT PROTECTION

A fuse with rating of 4 A / 250 V (Time Lag type) shall be installed on the input line side near the input connector and no any electrical components before.

2.3 OUTPUT REQUIREMENT

2.3.1 OUTPUT POWER

The total output power, under steady state conditions, shall not exceed 180 W.

2.3.2 OUTPUT VOLTAGE AND CURRENT

Under any combination of line and load variation and environmental conditions, all outputs shall remain within tolerance as defined in Table 2. Output voltage(s) shall be measured at the load side of output connector.

Output Voltage	Voltage Range		Current Range		
	Lower Limit	Upper Limit	Minimum Load	Full rated load	PK Load
+24.0V	22.8V	25.2V	0.0A	7.5A	--

Table 2 - Output Voltage and Current

2.3.3 RIPPLE AND NOISE

Measurements shall be made with an oscilloscope with minimum of 20MHz bandwidth and 1:1 scope Probe, Output shall be bypassed at the connector with a 0.1µF ceramic disk capacitor and a 47µF electrolytic capacitor for general testing purpose.

Output Voltage	Maximum Ripple & Noise (Vp-p)
+24.0V	300mV

Table 3 – Ripple and Noise

2.3.4 OVER VOLTAGE PROTECTION

The power supply shall provide with over voltage protection such that under any single component failure.

The power supply provides output over voltage protected in latch off by zener diode, and no damage to customer device.

2.3.5 OVER CURRENT PROTECTION

The power supply shall be protected when operating any output in overload condition. The power supply shall be shut down and no any damage when the over current condition occurs on the output, and It will be auto-recovered when the failure is removed.

Output Voltage	Over current protection		Test condition
	Lower Limit	Upper Limit	Input voltage:100Vac 60Hz or 240Vac 50Hz.
+24.0V	8.3A	12.0A	

Table 4 –Over current protection

2.3.6 OVERSHOOT

During turn on or turn off, the output overshoot shall not exceed nominal output voltage by more than 10%, and output shall not change its polarity with respect to its return line.

2.3.7 SHORT CIRCUIT POTECTION

Power supply shall have self-limiting protection to protect against short circuit or overload conditions. No damage to the power supply shall result from a continuous or intermittent short circuit condition. It will be auto-recovered when the failure is removed.

2.3.8 AUDIBLE NOISE

There is no audible noise canned been heard when it work with rated spec.

Test condition: The distance between microphone and the object should be 30cm spec ＜30 BA.

2.4 PERFORMANCE REQUIREMENT

2.4.1 EFFICIENCY

Active average mode Efficiency (watt out / watt in) shall be a minimum of 89.00 % at 230vac/50Hz.

Active average mode Efficiency (watt out / watt in) shall be a minimum of 89.00 % at 115vac/60Hz.

Complies to EPA DOE standard specification and EU CEC standard specification (Level VI).

calculate the model is single average active mode efficiency for each test voltage by testing at 100%,75%,50%,and 25% of rated current output and then computing the simple arithmetic average of these four values respectively at 115V/60HZ and 230V/50HZ test result for reference.

Efficiency (watt out / watt in) shall be a minimum of 79.00 % at 10% full load.

Note: when testing efficiency, adapter needs to electrify to perform after full load 60 minutes

Input voltage 115Vac 60Hz or 230Vac 50Hz

2.4.2 TURN ON DELAY TIME

Output shall reach steady state within 3 seconds of turn on at 100Vac or greater.

Output shall reach steady state within 2 seconds of turn on at 240Vac or greater.

2.4.3 HOLD-UP TIME

Hold-up time shall be a minimum of 8 mS at 100Vac / 60Hz input.

2.4.4 DYNAMIC LOAD

Power supply output voltage tolerance shall be complied with ± 10%.

Step load change: from 50% to100% Load on the output.

Dwell Time: 100Hz & 1 KHz 50% duty.

Slew rate: 0.5A/uses

3 ENVIRONMENTAL SPECIFICATION

3.1 TEMPERATURE

Operation within specification: -10 to 40 degrees C.

Storage: -20 to 85 degrees C

3.2 HUMIDITY

Operation: 10% to 90% relative humidity, non-condensation.

Storage: 5% to 95% relative humidity, including condensation.

3.3 VIBRATION AND SHOCK

The power supply shall be designed to withstand normal transportation vibration per MIL-STD-810F, method 514 and procedures X, as it is mounted in the chassis assembly and packed for shipping.

3.4 ALTITUDE

The power supply shall operate properly at any altitude between 0 ~ 16,404 feet (5000 meter) above sea level, and withstand storage at 50,000 feet.

3.5 CALCULATED MEAN TIME BETWEEN FAILURES (MTBF)

The MTBF for the power adapter shall equal or exceed 400,000 hours when operated at 75% rated load in an ambient temperature of 25 degree C.

3.6 BURN-IN

Burn-in test:

Test condition: 110Vac / 220Vac 50Hz, with 100% maximum load at 40 ±2℃ ambient temperature.

Test method: burn-in 110 minutes; and 30 seconds “ON”, 30 seconds “OFF” within 5 minutes, then 5 minutes "ON"

Test criteria: during this conditioning the power supply output normal and no damage or hazardous condition will occur.

ORT and life test:

Input condition: 110Vac / 220Vac 50Hz, "ON/OFF" 10 times within 5 minutes,45 minutes "ON" 45 minutes "OFF",

Test condition: cycle by cycle test 168 hours with 100% maximum load at 40 ±2℃ ambient temperature.

Test criteria: during this conditioning the power supply output normal and no damage or hazardous condition will occur.

4 RELATED SPECIFICATION

4.1.1 ~~EMI~~

VCCI Class-B

FCC 15(Class-B, 115Vac operation)

CISPR 22 Class-B limits

EN55022 (1998+A1:2000+A2:2003 Class-B limits)

47 CFR Part 15, Subpart B, Class B limits

GB 9254 ITE Emissions Latest Edition

4.1.2 DIELECTRIC STRENGTH—(HI-POT)

Primary to secondary: 1500VAC.

Test time: 60 second

Cut-off current: 10mA max

Arcing current: 10mA max

4.1.3 SURGE

It is referring to EN61000-4-5 IEC61000-4-5:2001 Level 4.

Differential mode surge immunity: 1KV

Common-mode Surge Immunity: 2KV

＊Determination level: Criteria A (Product testing and testing before and after any change in function is not).

4.1.4 ELECTROSTATIC DISCHARGE ESD

It is referring to EN61000-4-2, IEC61000-4-2:2001, IEC801-2 Level 3.

Contact electrostatic discharge: + - 6KV.

Air electrostatic discharge: + - 8KV.

＊Determination level: Criteria A (Product testing and testing before and after any change in function is not).

4.1.5 RF IMMUNITY

It is referring to IEC61000-4-3 Class A 3V/m

4.1.6 ENVIRONMENT STANDARDS

RoHS Regulation

The RoHS compliance symbol will be included on the data plate.

4.1.7 E LECTRICAL FAST TRANSIENTS (EFT)

It is referring to IEC61000-4-4 Class B Test Voltage: 2KV

4.1.8 GROUNDING

Adapter AC inlet FG pin to DC plug FG 0.1 ohm max at 25A/60second.

5 MECHANICAL

5.1 INPUT CONNECTOR AND OUTPUT CABLE

5.1.1 INPUT CONNECTOR

AC Input connector shall be IEC320 C14 or C6 power connector.

5.1.2 OUTPUT CABLE

Please read the reference to FIG.

5.2 AC ADAPTER EXTERNAL DIMENSION

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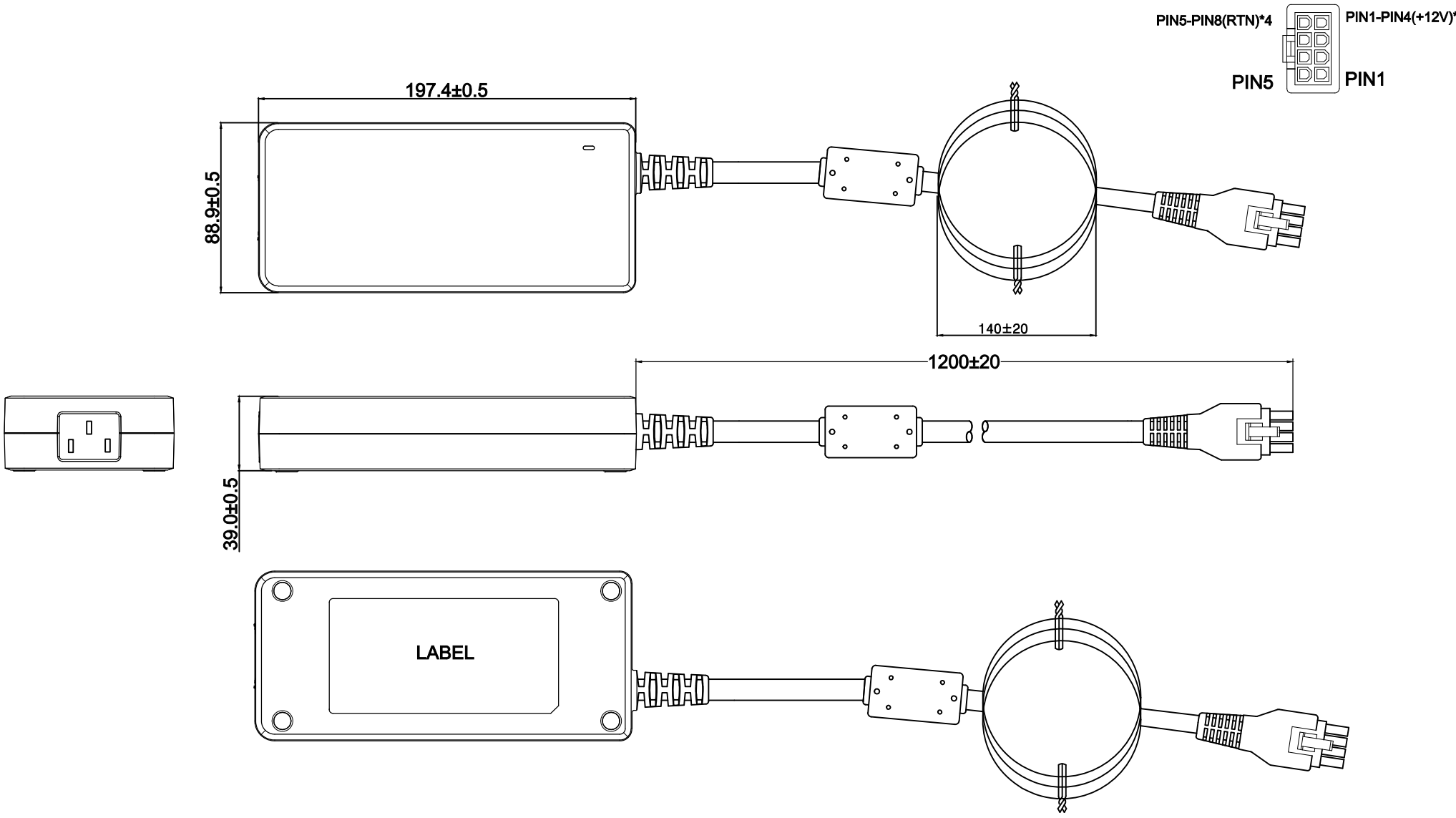

Doc. EA-0346

No	有害物質名稱	含量標準
1	鎘 (Cd)	<75ppm
2	鉛 (Pb)	<800ppm
3	汞 (Hg)	<800ppm
4	六價鉻 (Cr^{6})	<800ppm
5	多溴聯苯 (PBB)	<800ppm
6	多溴二苯醚 (PBDE)	<800ppm
7	鎘,鉛,汞,六價鉻,(包裝材料)	總含量<100ppm

GENERAL TOLERANCE ± (UNLESS OTHERWISE SPECIFIED)

DIMENSION \ LEVEL	SELECT LEVEL : x A	B	C	ANGULAR TOLERANCE
X < 8	±0.1	±0.15	±0.2	±0.3°
8 ≤ X < 25	±0.1	±0.2	±0.3	±0.5°
25 ≤ X < 100	±0.15	±0.25	±0.4	±0.5°
100 ≤ X < 300	±0.2	±0.3	±0.5	± 1°
300 ≤ X < 800	±0.3	±0.5	±0.8	±1.5°

REV.	DATE	APPROVED	DESCRIPTION
			UNIT: mm
			MATERIAL
			******
APPROVED		CHECKED	DESIGNED
DATE:		DATE:	DATE: 20160707

MODEL NO.: **KPM-220W**
PART NO:
DRAWING NO.:
SCALE: 1: 1
SHEET 1 OF 1
M XX
THIRD ANGLE PROJECTION