

# **PRODUCTS MANUAL**

## **MRT/MRW SERIES**

### **PS/2 Size Mini-Redundant Power Supply**

Rev.: A1

P/N: 702-10042

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## 1.1 INTRODUCTION

First of all, thank you for purchasing MRT/MRW Series – PS/2 size Mini Redundant power supply. The MRT/MRW Series are 1+1, Hot swappable/Hot-pluggable/Redundant power supply set, it consists of:

- (1) Complete metal frame (nickel-plated)
- (2) Compact size (real PSII form factor) 1+1 power modules
- (3) Backplane board

The MRT/MRW Series of hot swappable redundant power supply offer maximum 300/320/400 watts of output power. The MRT/MRW series provide Active Power Factor correction (PFC) at full range AC Input that complies with IEC 1000-3-2 for CE norms. The units are compact size as PS/2 form factor and all the power modules are built interior 40X40X20 mm /40X40X28 mm ball bearing DC fans for better ventilation. Each power module has been designed with +3.3V, +5V, +12V, -12V, -5V & 5VSB circuits. All you can see on the backplane board are passive components and this is the key point of greater MTBF.

The units also provide a warning sub-system, including LED display, buzzer alarm, TTL signal etc.. At the same time, it also indicates the status of the power system and DC fans.

When all the power modules are at normal condition, it balances the load share through its parallel design and results in the increasing reliability of the power system.

In order to use the power supply more effectively and safely, we suggest that you read through this manual carefully in advance of the installation and any operation.

## **1.2 PACKING**

Your MRT/MRW box package should consist of the following:

- (A) MRT/MRW Redundant set \*1
- (B) Accessory pack \*1
- (C) Product manual \*1

## **1.3 MODEL DESIGNATION**

Model number identification:

MRT --- 6300P, 6320P

MRW --- 6400P, 6420P

MR --- Mini-Redundant (AC Input)

6 --- for 6 DC outputs (5V/12V/-5V/-12V/3.3V/5VSB) for  
ATX 2.03/ATX 12V/EPS12V (SSI) Spec.

300/320/400/420 --- total output power (unit: watt)

P --- with PFC (Power Factor Correction) built in

## 1.4 FEATURES

MRT/MRW Series --- Mini Redundant power supply (W/PFC).

1+1, Hot swappable, Hot pluggable, AC Input

PSII Size, 300W/320W/400W/420W +300W/320W/400W/420W, W/PFC

- ◆ Dimension : 86 (H) x 150 (W) x 185 (D) m/m
- ◆ True Redundant design (Passive backplane)
- ◆ All circuit been designed in the power module
- ◆ Hot swap, Hot plug ability
- ◆ Full range operation (AC input voltage 90V~264V )
- ◆ Active Power Factor Correction (PFC) built in
- ◆ ATX 300W +300W /320W+320W /400W+400W /420W+420W output  
power
- ◆ Balanced load sharing design
- ◆ Remote sensing design
- ◆ Meet FCC, CISPR EMI regulation
- ◆ Isolated fence design to meet safety regulation
- ◆ Compact size (PSII form factor)
- ◆ Revovable handle design

## **1.5 PRE-INSTALLATION**

Before installing the MRT/MRW unit into the system chassis, please review the following drawing page and find out the best way to match them.

## **1.6 DRAWING ( page 6~8)**

## **1.7 SPECIFICATIONS ( page 9~10)**

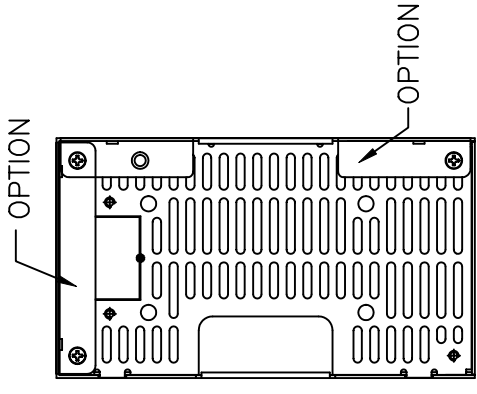
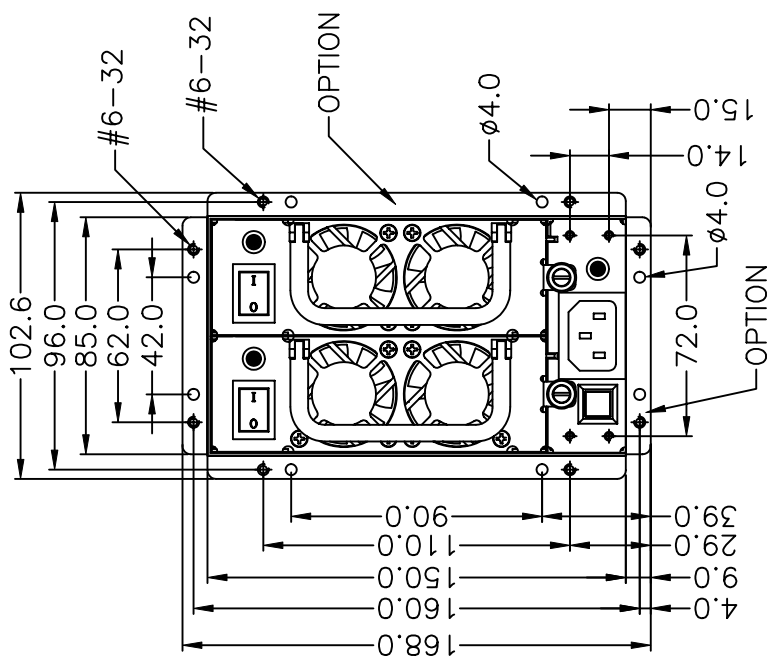
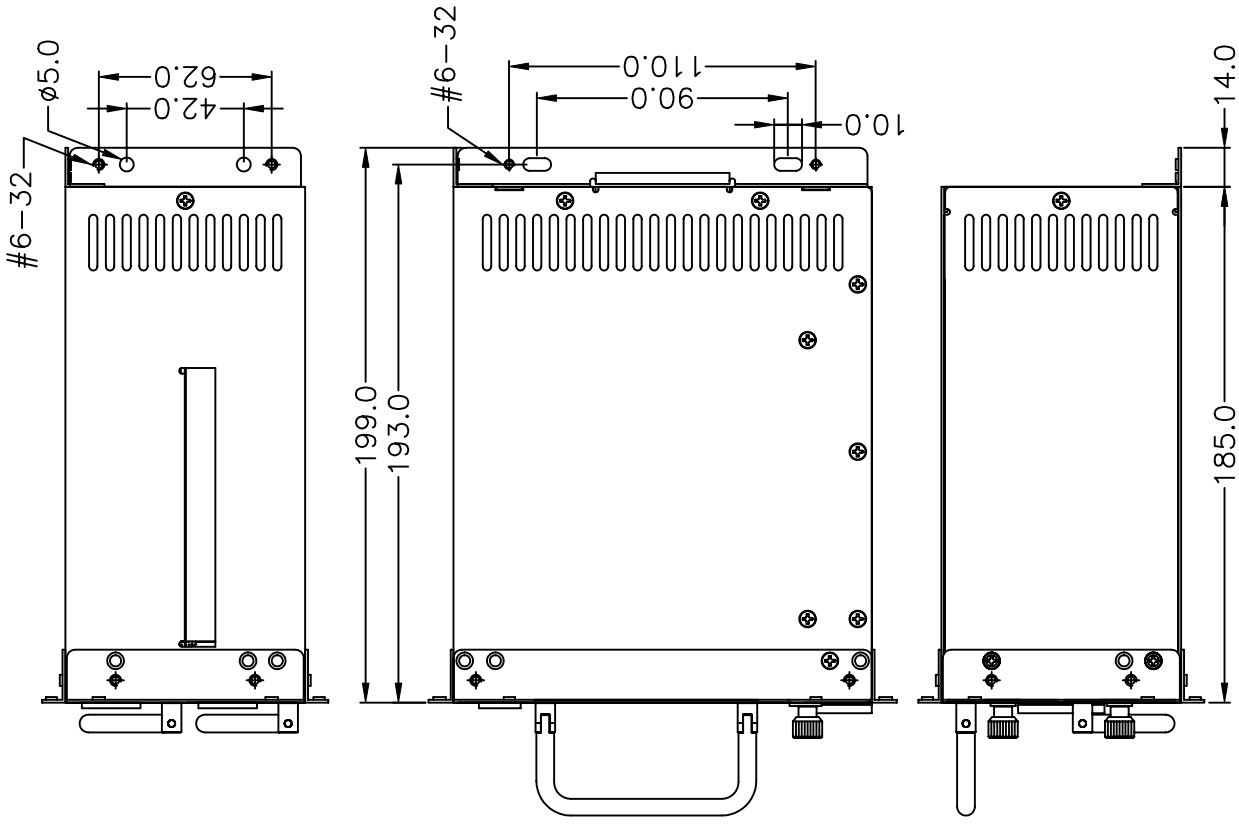
版次 REV.	圖號 DESCRIPTION	日期 DATE
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6	7
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4	5
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3	2
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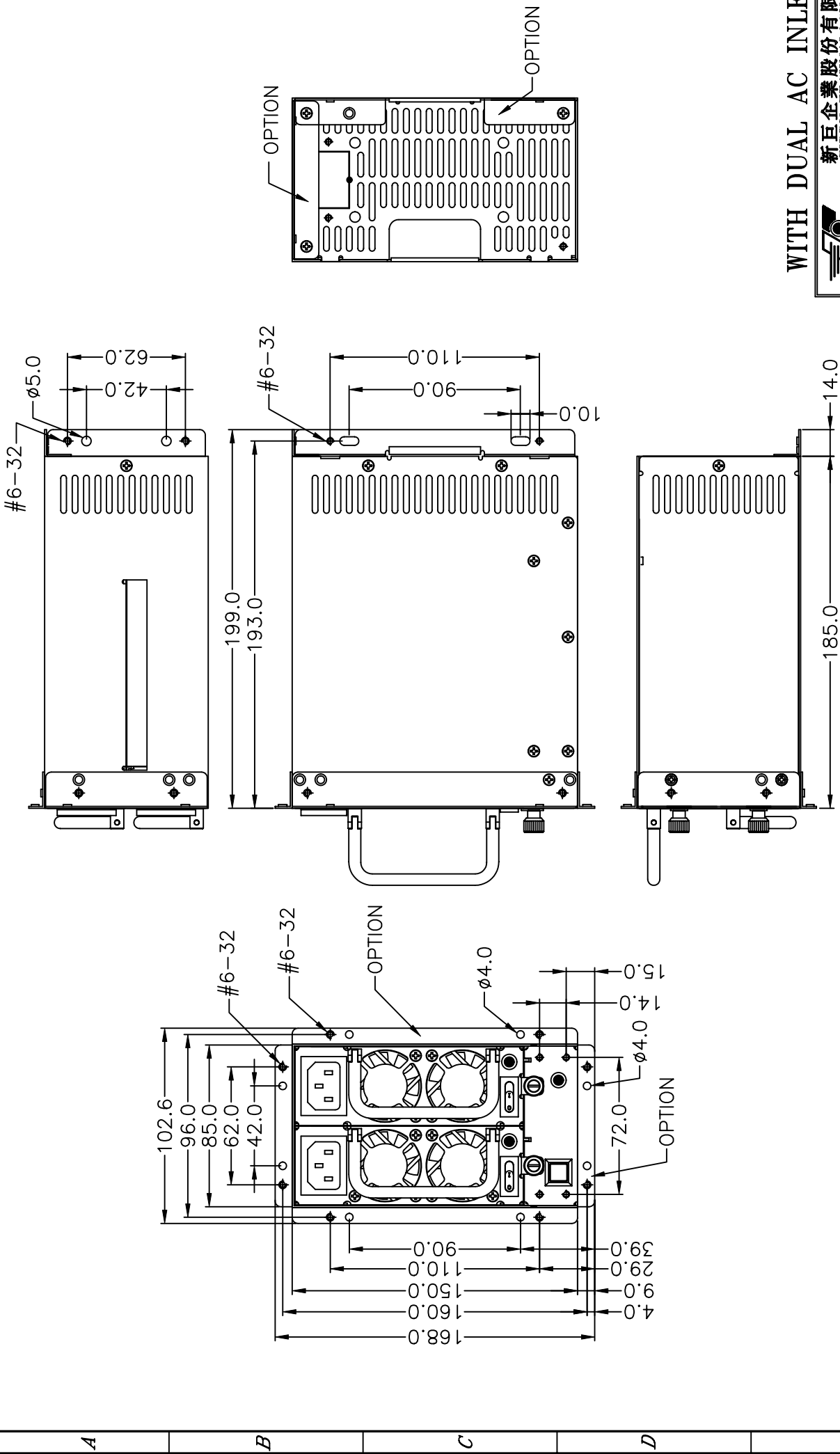


WITH SINGLE AC INLET

EMACS		新巨企業股份有限公司 ZIPPY TECHNOLOGY CORP.	
POWER DIVISION			
品名:	MODEL NO:	料號:	MRT0MA00
圖號:	FILE NO:	圖號:	MRT0MA00
單位:	REV. NO:	單位:	規格: A1
UNIT:	REV. NO:	UNIT:	編號: OF

材料規格:	日期:
MATERIAL:	DATE:
核准者:	日期:
APPROVE BY:	DATE:
審核者:	日期:
CHECK BY:	DATE:
繪圖者:	日期:
DRAW BY:	DATE:
容許公差:	日期:
TOLERANCES:	DATE:
.XXX ±.025	
.XX ±.100	
.X ±.250	
投影法:	日期:
PROJECTION:	DATE:
第三角法	日期:
	DATE:
	AUG-13-2002

原裝 REV.	REVISIONS	日期 DATE
	描述 DESCRIPTION	



WITH DUAL AC INLETS

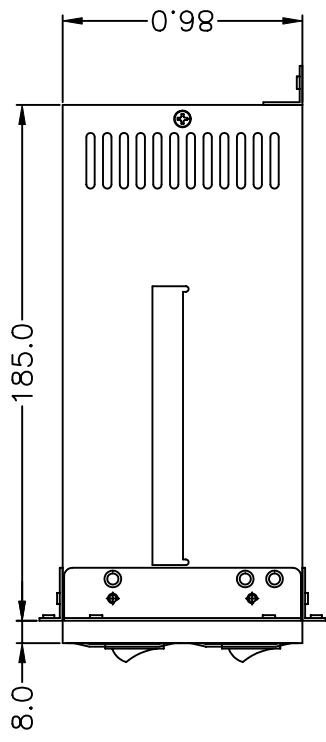
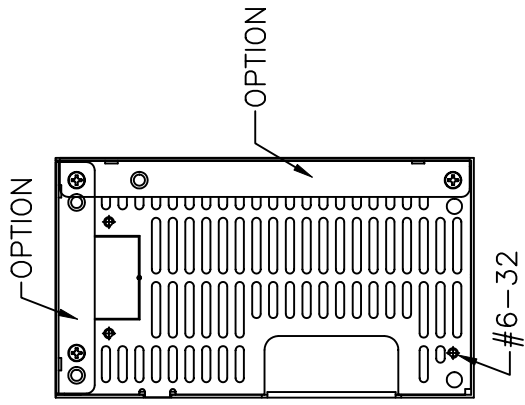
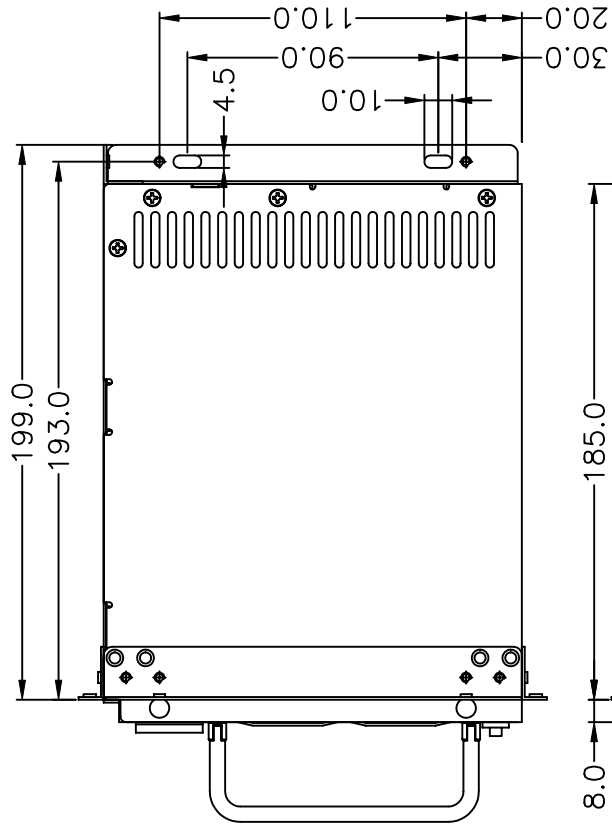
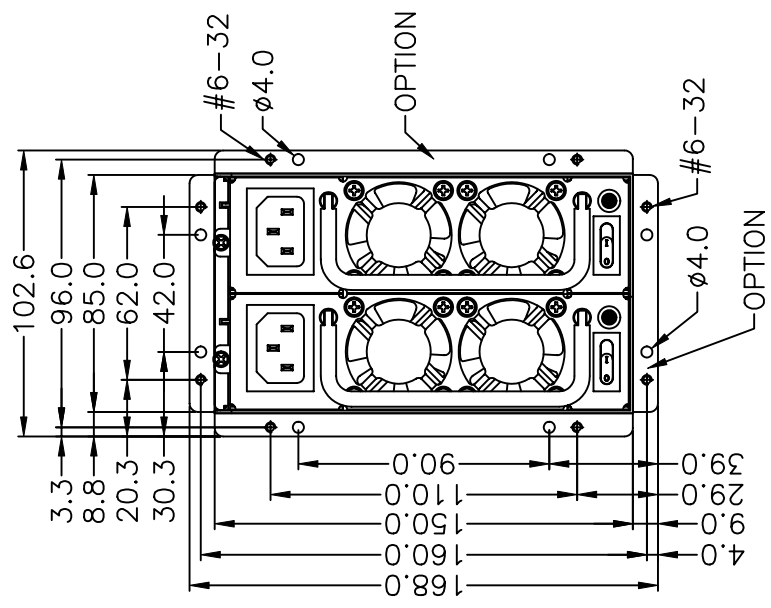
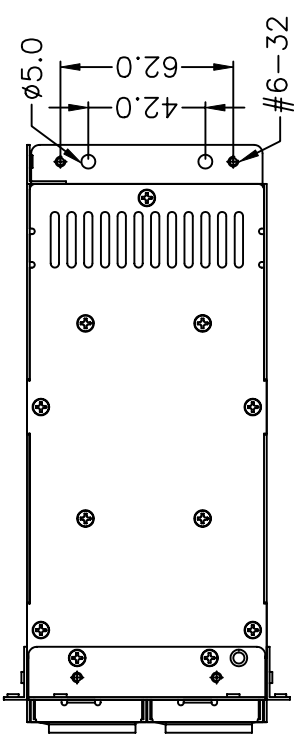
**EMACS** 新巨企業股份有限公司  
**ZIPPY TECHNOLOGY CORP.**  
 POWER DIVISION

品名: MRT 外觀尺寸圖 1  
 MODEL NO.:  
 PART NO.:  
 料號: MRTOMA01  
 圖號: MRTOMA01  
 DRAW. NO.:  
 繪圖者: MRTOMA01  
 單位:mm 版次: A1  
 REV. NO.: 規格: A1  
 SPEC: A1 編號: OF  
 SHEET: OF

容許公差:	材料規格:
TOLERANCES:	MATERIAL:
XXX ±.025	核准者:
.XX ±.100	APPROVE BY:
.X ±.250	CHECK BY:
	繪圖者:
	DRAW BY:
投影法:	日期:
PROJECTION:	DATE:
第三角法	日期:
第三角法	DATE:
	日期:
	DATE:
	日期:
	DATE:



版次 REV.	日期 DATE
修訂 REVISIONS	日期 DATE
描述 DESCRIPTION	日期 DATE



新巨企業股份有限公司  
 ZIPPY TECHNOLOGY CORP.  
 POWER DIVISION

品名: MRW 外觀尺寸圖  
 MODEL NO.: MRW0MA00  
 料號: MRW0MA00  
 PART NO.: MRW0MA00  
 圖號: MRW0MA00  
 FILE NO.: MRW0MA00  
 單位: mm  
 版次: A1  
 規格: A1  
 編號: A1  
 SHEET: OF

材料規格: MATERIAL:	日期: DATE:
核准者: APPROVE BY:	日期: DATE:
審核者: CHECK BY:	日期: DATE:
繪圖者: DRAW BY:	日期: DATE:
容許公差: TOLERANCES:	日期: DATE:
.XXX ±.025	日期: DATE:
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投影法: PROJECTION:	日期: DATE:
第三角法	日期: DATE:
圖號: AUG-02-2002	日期: DATE:

**INPUT CHARACTERISTICS:****MRT-6300/6320P**

- VOLTAGE: 90 ~ 264 VAC FULL RANGE
- FREQUENCY : 47 ~ 63 Hz
- INPUT CURRENT: 6.0 / 3.0 A FOR 115 / 230 VAC
- INRUSH CURRENT: 60A / 80A MAX. FOR 115 / 230 VAC PER POWER MODULE

**OUTPUT CHARACTERISTICS:**

OUTPUT VOLTAGE	OUTPUT CURRENT			REGULATION		OUTPUT
	MIN.[A]	MAX.[A]	PEAK(A)	LOAD	LINE	RIPPLE & NOISE MAX. [P-P]
5V	3.0	25		± 5%	± 1%	50mV
12V	2	16	20	± 7%	± 1%	120mV
-5V	0.	0.5		±10%	± 1%	150mV
-12V	0.	0.5		±10%	± 1%	150mV
3.3V	1.0	18		± 5%	± 1%	50mV
+5VSB	0.1	2.0		± 5%	± 1%	60mV

REMARKS: TOTAL CURRENT OF +5V AND + 3.3V NOT EXCEED 35 A

TOTAL +5V AND 3.3V AND 12V POWER NOT EXCEED 282/302 W

- TEMPERATURE RANGE : OPERATING 0<sup>0</sup>C --- 40<sup>0</sup>C, STORAGE -20<sup>0</sup>C --- 70<sup>0</sup>C
- HOLD UP TIME: 16 ms MINIMUM AT FULL LOAD & 90 VAC INPUT VOLTAGE
- DIELECTRIC WITHSTAND: INPUT / OUTPUT 1500 VAC FOR 1 MINUTE  
INPUT TO FRAME GROUND 1500 VAC FOR 1 MINUTE
- EFFICIENCY: 63% TYPICAL, AT FULL LOAD
- POWER GOOD SIGNAL: ON DELAY 100 ms TO 500 ms, OFF DELAY 1 ms
- OVER LOAD PROTECTION: 110 ~ 160% MAX.  
OVER VOLTAGE PROTECTION:  
**+5V → 5.7V ~ 6.6V, 3.3V → 3.9 ~ 4.3V, 12V → 13.0 ~ 14.6V**
- OVER CURRENT PROTECTION : 5V, 12V, 3.3V 130% +/- 20% AT FULL LOAD  
-5V, -12V SHORT CIRCUIT
- EMI NOISE FILTER: FCC CLASS B, CISPR22 CLASS B
- SAFETY: UL 1950, CSA 22.2 NO/ 950, TÜV IEC 950
- REMOTE ON / OFF CONTROL
- FAULTY ALARM METHODS : LED, BUZZER, TTL SIGNAL
- HOT-SWAPPABLE / HOT-PLUGGABLE REDUNDANCY FUNCTION
- BALANCE LOAD SHARING DESIGN
- REMOTE SENSING DESIGN
- ISOLATION: BUILT-IN IN THE POWER MODULE
- MEET IEC-1000-3-2 CLASS D ( ACTIVE PFC )
- DIMENSION: 86(H) X 150(W) X 185 (D) mm
- COOLING : TWO 40 mm DC FANS (MODULE)
- AC INLET IN EACH MODULE, SINGLE AC INLET -- OPTIONAL

**INPUT CHARACTERISTICS:****MRW-6350P/6400P/6420P**

- VOLTAGE: 90 ~ 264 VAC FULL RANGE
- FREQUENCY : 47 ~ 63 Hz
- INPUT CURRENT: 8.0 / 4.0 A FOR 115 / 230 VAC
- INRUSH CURRENT: 60A / 80A MAX. FOR 115 / 230 VAC PER POWER MODULE

**OUTPUT CHARACTERISTICS:**

OUTPUT VOLTAGE	OUTPUT CURRENT			REGULATION		OUTPUT
	MIN.[A]	MAX.[A]	PEAK	LOAD	LINE	RIPPLE & NOISE MAX. [P-P]
5V	3.0	35		± 5%	± 1%	50mV
12V	2	22/28/28		± 6%	± 1%	120mV
-5V	0	0.5		±10%	± 1%	150mV
-12V	0	1.2		±10%	± 1%	150mV
3.3V	1.0	25		± 5%	± 1%	50mV
+5VSB	0.1	2.0		± 5%	± 1%	60mV

REMARKS: \* NEITHER +5V & + 3.3V NOR +3.3V & 12V SHOULD EXCEED 40/48/48 A

\* TOTAL MAXIMUM OUTPUT OF 5V, 3.3V AND 12V : 330W / 378W / 398W

- TEMPERATURE RANGE : OPERATING 0°C --- 40°C, STORAGE -20°C --- 70°C
- HOLD UP TIME: 16 ms MINIMUM AT FULL LOAD & 90 VAC INPUT VOLTAGE
- DIELECTRIC WITHSTAND: INPUT / OUTPUT 1500 VAC FOR 1 MINUTE  
INPUT TO FRAME GROUND 1500 VAC FOR 1 MINUTE
- EFFICIENCY: 63% TYPICAL, AT FULL LOAD
- POWER GOOD SIGNAL: ON DELAY 100 ms TO 500 ms, OFF DELAY 1 ms
- OVER LOAD PROTECTION: 110 ~ 160% MAX.  
OVER VOLTAGE PROTECTION:  
**+5V → 5.7V ~ 6.6V, 3.3V → 3.9 ~ 4.3V, 12V → 13.0 ~ 14.6V**
- OVER CURRENT PROTECTION : 5V, 12V, 3.3V 130% +/- 20% AT FULL LOAD  
-5V, -12V SHORT CIRCUIT
- EMI NOISE FILTER: FCC CLASS B, CISPR22 CLASS B
- SAFETY: UL 1950, CSA 22.2 NO/ 950, TÜV IEC 950
- REMOTE ON / OFF CONTROL
- FAULTY ALARM METHODS : LED, BUZZER, TTL SIGNAL
- HOT-SWAPPABLE / HOT-PLUGGABLE REDUNDANCY FUNCTION
- BALANCE LOAD SHARING DESIGN
- REMOTE SENSING DESIGN
- ISOLATION: BUILT-IN IN THE POWER MODULE
- MEET IEC-1000-3-2 CLASS D ( ACTIVE PFC )
- DIMENSION: 86(H) X 150(W) X 185 (D) mm
- COOLING : TWO 40 mm DC FANS (MODULE)
- AC INLET IN EACH MODULE

## 1.8 INSTALLATION & TESTING

Turn off (Remote off) the on/off switch. Mount the power supply in the system chassis using the proper mounting hardware, the mounting holes in the power supply should match with those in the case. Attach the connectors to the M/B by following the M/B instructions, there are various connectors / pin-outs of both power supply and M/B. They should match each other; otherwise the connection will cause undetectable harms.

Attach all the remaining power supply connections to the various peripherals as needed. These connectors are “keyed”, so there will be only one possible way to connect them.

Before applying power to the system, make sure there are no loose or incorrect connections. You do not need to worry about the setting of AC Input voltage because of the units’ full range features.

Double check that all pin-outs & connections to the M/B are matched properly. Maybe you would like to test the redundancy function before you put back the cover of your system chassis. Turn on (Remote on) the on/off switch, you will notice if the power unit operates properly, individual LEDs and external warning LED (please refer to Sec. 1.11 for detail explanation) are lit Green. Then, when you remove one of the power modules, the warning buzzer in the power system will sound and the external warning LED which displays the status of the total power supply system will change color to be Red.

The individual LEDs (both on the rear side or on the front control panel) indicating the power supply's status will not light. Meanwhile, the other power module will continue to backup the power output without affecting the computer system's operation or cause system shut-down.

The warning buzzer will continue sound until the user reset the warning buzzer by pressing the buzzer reset or use the reset switch. The buzzer reset switch can be connected by wires lead provided by the power supply system (please refer to Sec. 1.11) and found on the front control panel of the system chassis.

After inserting the power module that is removed for testing earlier, the sound of the warning buzzer will disappear and the external warning LED will turn Green again. The individual LED indicating the status of the power supply will light again. Then, test the other power module by performing the same procedure of the above.

If you use the power detective signal, there are two/three pins connector (refer to Sec. 1.9), it should be connected to the card properly.

If everything works fine, then turn off (remote off) the power system.

You can then put back the cover of the case and tighten it with the screws.

Now you have completed the testing and installation of MRT/MRW redundant power supply system.

## 1.9 HOT SWAP PROCEDURES

Please refer to the following when either power module or the fan found defective.

A) Locate and turn on the defective power module by examining the individual LED (if LED without light, it indicates the power module is defective).

**\*\*\*WARNING:**

*Please perform the above step carefully otherwise it may cause shut down the whole system.*

B) Turn off the individual on/off switch of the defective power module.

**\*\*\*WARNING:**

*Please do not remove the defective power module until you have worn gloves to keep from be burned. This is due to the cover of the power module has been used as heat sink for cooling, usually the temperature is around 50 ~ 60 degree Celsius under full condition.*

C) Loosen the thumb screws of the power module

D) Remove the defective power module by pulling out

**\*\*\*WARNING:**

*Please put aside the power module for cooling down. Prevent other people from touching it until it cools down.*

E) Replace with a functional power module and insert it into the power system to the end.

- F) Turn on the power module.
- G) Check the LED of the power module that should light Green.
- H) Check the LED indicating the total power status, which should change from Red to Green.
- I) Tighten the screws and fix the power module.
- J) If you want to test this functional power module in simulating defective situation. Please refer to the Section 1.8 Installation & Testing.

*Remarks: If the DC fan of the power module fails, you have to replace the power module. Please follow the same procedures.*

## 1.10 PINOUTS AND FUNCTION OF THE CONNECTORS

\*\*\* Please be aware of the polarity\*\*\*

### THE LED CONNECTOR OF POWER#1

PIN#	COLOR
1	GREEN
2	BLACK

### THE LED CONNECTOR OF POWER#2

PIN#	COLOR
1	ORANGE
2	BLACK

### THE LED CONNECTOR OF TOTAL POWER SYSTEM

PIN#	COLOR
1	RED
2	BLACK
3	GREEN

### THE BUZZER RESET SWITCH CONNECTOR

PIN#	COLOR
1	YELLOW
2	BLACK

### THE SIGNAL CONNECTOR OF POWER RESET

PIN#	COLOR	VOLTAGE
1	RED	TTL SIGNAL
2	BLACK	GND



## 1. 11 TROUBLE SHOOTING

If you have followed these directions correctly, there should be no problem occurred. Same common symptoms are: the system doesn't work, buzzer sound, work for a very short period, etc., please try the following steps to verify and correct it:

1. Check all the connections (correct pinouts, loose connections, wrong direction, etc).
2. Check for short-circuits or defective peripherals by unhooking each peripheral once at a time. When the system functions again, you have solved the problem.
3. Once you hear the buzzer sound or see the LED with RED light, please be aware of :
  - a. If the load is under the minimum / over the maximum load of each channel (please refer the Sec. 1.7 specification)?
  - b. If AC/DC Input voltage been set correct?
  - c. If each power cord been well plugged into the inlet?

Suppose the above condition been happened, please unplug the power cords, wait for 2 ~ 3 minutes for releasing the protection state, then test it again.

- d. If buzzer still sound or the LED shows power module is defective, please locate which power module is defective, perform hot-swap procedure (please refer to the Sec. 1.9 Hot-swap procedures), sent the defective power module to your vendor for RMA operation.
- e. If you can not fix the problem, please contact with your vendor for supporting.



The “RELIABILITY “ solution to E-application

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