

MEAN WELL

MD-100S

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Features :

ZVT technology to reduce power dissipation and improve efficiency

Various output configuration is selectable

Built in active PFC, PF>0.95

Universal AC input/ full range

Remote Control on every individual output module

Remote Sense on every individual output module(MS-75,150,300,360)

Remote margin/V-Program

Built in parallel function(MS-210/300/360)

Protections: Short circuit / Overload / Over voltage for all output modules

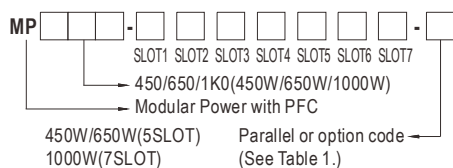
Additional 12V/0.1A auxiliary output for remote control

Cooling by built-in DC fan with fan alarm function

3 years warranty



Output Configuration Guide



Example: MP1K0-

A	2	E	#	S	2	K
---	---	---	---	---	---	---

SLOT1 O/P:2V@25A

SL0T2 3 0/P:12V/@2

CLOT4, Black: Clot

Slot 14 Blank Slot

SLOT5 O/P:5V@10A
12V@4.2

SLOT6 7 0/P:48V@6

Single output(MS-150) 1 SLOT (150W max.)	
Voltage code	Voltage
A	2V
B	3.3V
C	5V
D	7.5V
E	12V
F	15V
G	18V
H	24V
I	27V
J	33V
K	48V

Single output(MS-210) 1 SLOT (210W max.)	
Voltage code	Voltage
a	2V
b	3.3V
c	5V
d	7.5V
e	12V
f	15V
g	18V
h	24V
i	27V
j	33V
k	48V

Single output(MS-300) 2 SLOT (300W max.)	
Voltage code	Voltage
2A	2V
2B	3.3V
2C	5V
2D	7.5V
2E	12V
2F	15V
2G	18V
2H	24V
2I	27V
2J	33V
2K	48V

Single output(MS-360) 2 SLOT (360W max.)	
Voltage code	Voltage
2a	2V
2b	3.3V
2c	5V
2d	7.5V
2e	12V
2f	15V
2g	18V
2h	24V
2i	27V
2j	33V
2k	48V

Single output(MS-75) 1 SLOT (75W max.)	
Voltage code	Voltage
L	3.3V
M	5V
N	12V
O	15V
P	24V
Q	48V

Dual output(MD-100) 1 SLOT (100W max.)	
Voltage code	Voltage
R	5V
	5V
S	5V
	12V
T	5V
	15V
U	24V
	5V
V	24V
	12V
W	12V
	12V
X	15V
	15V

SPECIFICATION

MODEL		PFC-450	PFC-650	PFC-1000
INPUT	VOLTAGE RANGE	85 ~ 264VAC 120 ~370VDC		
	FREQUENCY RANGE	47 ~ 63Hz		
	POWER FACTOR	PF>0.95/230VAC PF>0.98/115VAC at full load		
	EFFICIENCY Note.1	82.5% typ.	84% typ.	84% typ.
	AC CURRENT	6.3A/115VAC 3.2A/230VAC	9A/115VAC 4.5A/230VAC	13.5A/115VAC 6.7A/230VAC
	INRUSH CURRENT	25A/115VAC 40A/230VAC	30A/115VAC 50A/230VAC	20A/115VAC 40A/230VAC
	LEAKAGE CURRENT	<1.5mA/240VAC		
OUTPUT	TOTAL OUTPUT POWER	450W max.	650W max.	1000W max.
PROTECTION	OVER TEMPERATURE	Thermal switch detect on the heatsink of power MOSFET		
	FAN ALARM	Protection type : Shut down o/p voltage, recovers automatically after temperature goes down Output shutdown when FAN is malfunction		
FUNCTION	REMOTE CONTROL	RC+/RC-: 0 ~ 0.8V or Short, Power ON RC+/RC-: 4 ~ 12V or Open, Power OFF		
	AUXILIARY POWER(AUX)	12V@0.1A(only for Remote ON/OFF Control)		
ENVIRONMENT	WORKING TEMP.	-20 ~ +70 (Refer to "Derating Curve")		
	WORKING HUMIDITY	20 ~ 90% RH non-condensing		
	STORAGE TEMP., HUMIDITY	-40 ~ +85 , 10 ~ 95% RH		
	TEMP. COEFFICIENT	0.03%/ (0 ~ 50)		
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes		
SAFETY & EMC (Note 5)	SAFETY STANDARDS	UL60950-1, TUV EN60950-1 approved		
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:2KVAC O/P-FG:0.5KVAC		
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms / 500VDC / 25ÿ/ 70% RH		
	EMC EMISSION	Compliance to EN55022 (CISPR22) Class B, EN61000-3-2,-3		
	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11, EN55024, EN61000-6-1, EN61204-3, light industry level, criteria A		
OTHERS	DIMENSION	254*127*63.5mm (L*W*H)	278*127*63.5mm (L*W*H)	278*177.8*63.5mm (L*W*H)
	PACKING	1.8Kg(typ.); 6pcs / 11.8Kg / 1.25CUFT	2.16Kg(typ.); 6pcs / 14Kg / 1.34CUFT	3Kg(typ.); 6pcs /19Kg / 1.74CUFT

Ÿ 1 SLOT Single output (150W) MS-150

Ÿ 1 SLOT Single output (210W) MS-210

■ 2 SLOT Single output (300W) MS-300

■ 2 SLOT Single output (360W) MS-360

2 SE01 Single output (300W) MS-360												
OUTPUT (MS-360)	OUTPUT VOLTAGE CODE	MS-360-2a	MS-360-2b	MS-360-2c	MS-360-2d	MS-360-2e	MS-360-2f	MS-360-2g	MS-360-2h	MS-360-2i	MS-360-2j	MS-360-2k
	DC VOLTAGE	2V	3.3V	5V	7.5V	12V	15V	18V	24V	27V	33V	48V
	RATED CURRENT	60A	60A	60A	48A	30A	24A	20A	15A	13.4A	11A	7.5A
	CURRENT RANGE	0 ~ 60A	0 ~ 60A	0 ~ 60A	0 ~ 48A	0 ~ 30A	0 ~ 24A	0 ~ 20A	0 ~ 15A	0 ~ 13.4A	0 ~ 11A	0 ~ 7.5A
	PEAK LOAD Note.4	69A	69A	69A	55.2A	34.5A	27.6A	23A	17.3A	15.5A	12.7A	8.7A
	RATED POWER	120W	198W	300W	360W	360W	360W	360W	360W	361.8W	363W	360W
	RIPPLE & NOISE (max.) Note.2	80mVp-p	100mVp-p	100mVp-p	100mVp-p	150mVp-p	150mVp-p	150mVp-p	150mVp-p	200mVp-p	250mVp-p	300mVp-p
	VOLTAGE ADJ. RANGE	1.6 ~ 2.6V	2.6 ~ 4V	4 ~ 6V	6 ~ 9V	9 ~ 13.2V	13.2 ~ 16.8V	16.8 ~ 20V	20 ~ 26.4V	25 ~ 31V	30 ~ 40V	40 ~ 53V
	VOLTAGE TOLERANCE Note.3	3.0%	2.0%	2.0%	2.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
	LINE REGULATION	0.5%	0.5%	0.5%	0.5%	0.3%	0.3%	0.3%	0.2%	0.2%	0.2%	0.2%
	LOAD REGULATION	2.0%	1.5%	1.0%	1.0%	0.5%	0.5%	0.5%	1.0%	1.0%	1.0%	1.0%
SETUP, RISE, HOLD UP TIME	1500ms, 50ms, 20ms at full load											
PROTECTION	OVERLOAD	116 ~ 150% rated output power Protection type : Constant current limiting, recovers automatically after fault condition is removed										
	OVER VOLTAGE	3 ~ 4V	4.1 ~ 5V	6.1 ~ 7.5V	9.1 ~ 11.2V	13.3 ~ 18V	16.9 ~ 22V	20.1 ~ 26V	26.5 ~ 35V	31.1 ~ 39V	40.1 ~ 48V	53.1 ~ 60V
FUNCTION	REMOTE INHIBIT CONTROL	RC+/RC-: 0 ~ 0.8V or OPEN. POWER ON RC+/RC-: 4 ~ 12V POWER OFF										

SPECIFICATION

1 SLOT Single output (75W) MS-75

OUTPUT (MS-75)	OUTPUT VOLTAGE CODE	MS-75L	MS-75M	MS-75N	MS-75O	MS-75P	MS-75Q
	DC VOLTAGE	3.3V	5V	12V	15V	24V	48V
	RATED CURRENT	15A	15A	6.3A	5A	3.2A	1.6A
	CURRENT RANGE	0 ~ 15A	0 ~ 15A	0 ~ 6.3A	0 ~ 5A	0 ~ 3.2A	0 ~ 1.6A
	PEAK LOAD Note.4	17.3A	17.3A	7.3A	5.8A	3.7A	1.8A
	RATED POWER	49.5W	75W	75.6W	75W	76.8W	76.8W
	RIPPLE & NOISE (max.) Note.2	80mVp-p	80mVp-p	150mVp-p	150mVp-p	150mVp-p	250mVp-p
	VOLTAGE ADJ. RANGE	2.6 ~ 4V	4 ~ 6V	9 ~ 13.2V	13.2 ~ 16.8V	20 ~ 26.4V	40 ~ 53V
	VOLTAGE TOLERANCE Note.3	2.0%	2.0%	1.0%	1.0%	1.0%	1.0%
	LINE REGULATION	0.5%	0.5%	0.3%	0.3%	0.2%	0.2%
	LOAD REGULATION	1.0%	1.0%	0.5%	0.5%	0.5%	0.5%
SETUP, RISE, HOLD UP TIME 1500ms, 50ms, 20ms at full load							
PROTECTION	OVERLOAD	116 ~ 150% rated output power					
		Protection type : Constant current limiting, recovers automatically after fault condition is removed					
	OVER VOLTAGE	4.1 ~ 5V	6.1 ~ 7.5V	13.3 ~ 18V	16.9 ~ 22V	26.5 ~ 35V	53.1 ~ 60V
FUNCTION	REMOTE INHIBIT CONTROL	Protection type : Shut down o/p voltage, re-power on to recover					
		RC+/RC-: 0 ~ 0.8V or OPEN, POWER ON RC+/RC-: 4 ~ 12V POWER OFF					

1 SLOT Isolated Dual output (100W) MD-100

OUTPUT (MD-100)	OUTPUT VOLTAGE CODE	MD-100R		MD-100S		MD-100T		MD-100U		MD-100V		MD-100W		MD-100X	
	DC VOLTAGE	5V	5V	5V	12V	5V	15V	24V	5V	24V	12V	12V	12V	15V	15V
	RATED CURRENT	10A	8A	10A	4.2A	10A	3.4A	2.5A	8A	2.5A	3.4A	5A	3.4A	4A	2.7A
	CURRENT RANGE	2 ~ 10A	0 ~ 8A	2 ~ 10A	0 ~ 5.8A	2 ~ 10A	0 ~ 4.7A	0.5 ~ 3A	0 ~ 10A	0.6 ~ 3A	0 ~ 4.7A	1 ~ 5A	0 ~ 5.8A	1 ~ 4.7A	0 ~ 4.7A
	RATED POWER Note.6	90W		100.4W		101W		100W		100.8W		100.8W		100.5W	
	RIPPLE & NOISE (max.) Note.2	100mVp-p	100mVp-p	100mVp-p	150mVp-p	100mVp-p	150mVp-p	200mVp-p	100mVp-p	240mVp-p	120mVp-p	120mVp-p	120mVp-p	150mVp-p	150mVp-p
	VOLTAGE ADJ. RANGE	4.75 ~ 5.5V	4.75 ~ 5.5V	4.75 ~ 5.5V	11.4 ~ 13.2V	4.75 ~ 5.5V	14.2 ~ 16.5V	22.8 ~ 26.4V	4.75 ~ 5.5V	22.8 ~ 26.4V	11.4 ~ 13.2V	11.4 ~ 13.2V	11.4 ~ 13.2V	14.2 ~ 16.5V	14.2 ~ 16.5V
	VOLTAGE TOLERANCE Note.3	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%	2.0%	3.0%	2.0%	3.0%	2.0%	3.0%
	LINE REGULATION	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%	0.5%	1.0%	0.5%	1.0%	0.5%	1.0%
	LOAD REGULATION	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	1.0%	2.0%	1.0%	2.0%	1.0%	2.0%
SETUP, RISE, HOLD UP TIME	1500ms, 50ms, 20ms at full load														
PROTECTION	OVERLOAD	105 ~ 150% rated output power													
		Protection type : Shut down o/p voltage, re-power on to recover													
	OVER VOLTAGE	5.6 ~ 7.2V	5.6 ~ 7.2V	5.6 ~ 7.2V	13.3 ~ 17V	5.6 ~ 7.2V	16.6 ~ 22V	26.5 ~ 34V	5.6 ~ 7.2V	26.5 ~ 34V	13.3 ~ 17V	13.3 ~ 17V	13.3 ~ 17V	16.6 ~ 22V	16.6 ~ 22V
		Protection type : Shut down o/p voltage, re-power on to recover													
FUNCTION	REMOTE INHIBIT CONTROL	RC+/RC-: 0 ~ 0.8V or OPEN, POWER ON							RC+/RC-: 4 ~ 12V POWER OFF						
NOTE	1. MP450:The value changed by installing different output modules. The efficiency in specification means output modules are composed by following modules. 5V(Voltage code C)*1, 12V(Voltage code E)*1, 24V(Voltage code H)*1, 5V(Voltage code M)*1. MP650:The value changed by installing different output modules. The efficiency in specification means output modules are composed by following modules. 5V(Voltage code C)*2, 12V(Voltage code E)*1, 24V(Voltage code H)*2. MP1K0:The value changed by installing different output modules. The efficiency in specification means output modules are composed by following modules. 5V(Voltage code C)*2, 12V(Voltage code E)*2, 24V(Voltage code H)*3. The hold-up time of above combination is 20ms(typ.) 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation. 4. 35% Duty cycle maximum within every 10 seconds. Average output power should not exceed the rated power. 5. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives. For guidance on how to perform these EMC tests, please refer to "EMI testing of component power supplies." (as available on http://www.meanwell.com) 6. If the output voltage adjust to higher level, the rated current should be derated to meet the total rated power for both outputs(For MD-100 only).														

Table 1. Parallel code(For MS-210~MS-300~MS-360 only)

Code	SLOT1	SLOT2	SLOT3	SLOT4	SLOT5	SLOT6	SLOT7
X						-----	-----
1	⊙		⊙			-----	-----
2		⊙		⊙		-----	-----
3			⊙		⊙		
4				⊙		⊙	
5	⊙		⊙		⊙		
6		⊙		⊙		⊙	

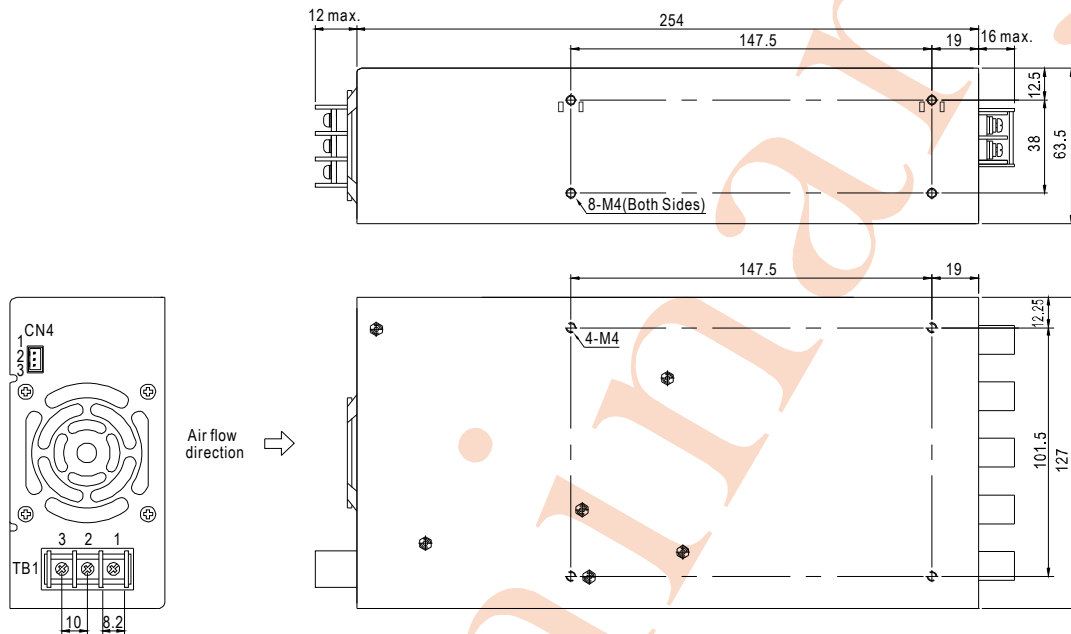
YCode X,1,2 for MP450,MP650

YCode X,1,2,3,4,5,6 for MP1K0

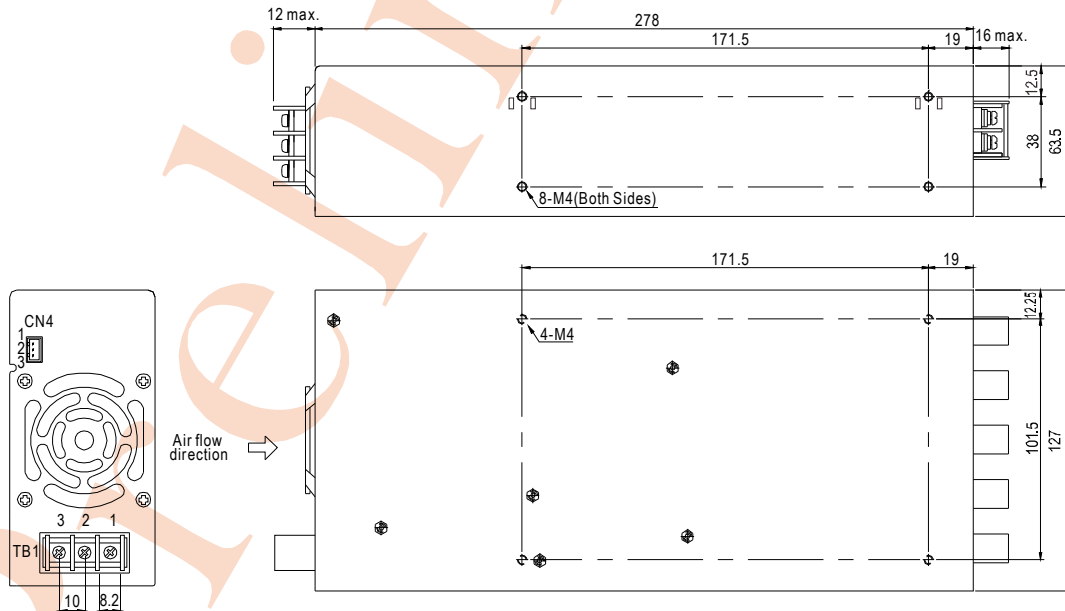
■ Mechanical Specification

Unit:mm

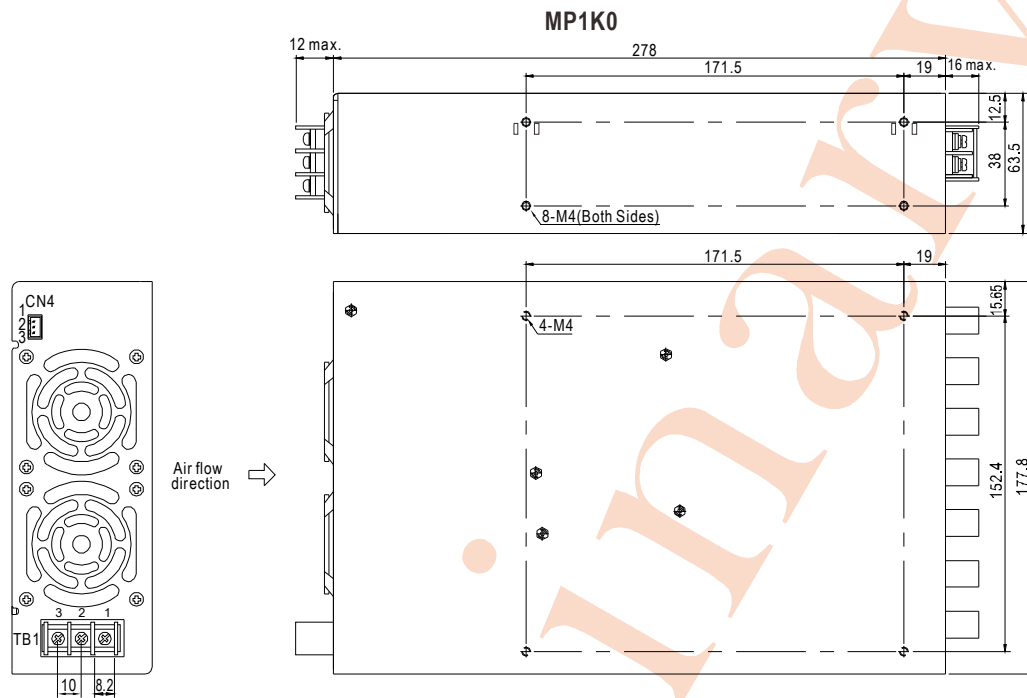
MP450



MP650



Mechanical Specification



TB1(PFC-450/650/1K0)

Pin No.	Assignment
1	AC/L
2	AC/N
3	FG $\perp$

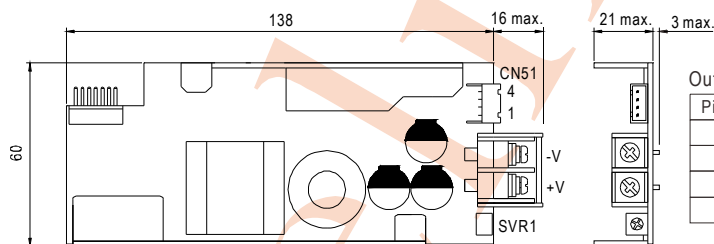
CN4(PFC-450/650/1K0) : JST B3B-XH or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	+RC: +Remote ON/OFF	JST XHP or equivalent	JST SXH-001T-P0.6 or equivalent
2	-RC: -Remote ON/OFF		
3	VCC: 12V/0.1A auxiliary output		

Mechanism of Output Modules

©MS-75

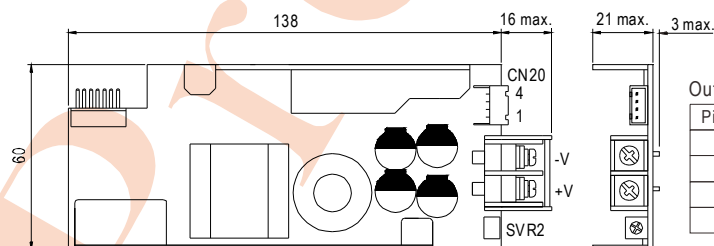
Unit:mm



Output Connector(CN51) : JST B4B-XH or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	+S: +Remote sensing	JST XHP or equivalent	JST SXH-001T-P0.6 or equivalent
2	-S: -Remote sensing		
3	+RC: +Remote ON/OFF		
4	-RC: -Remote ON/OFF		

©MS-150

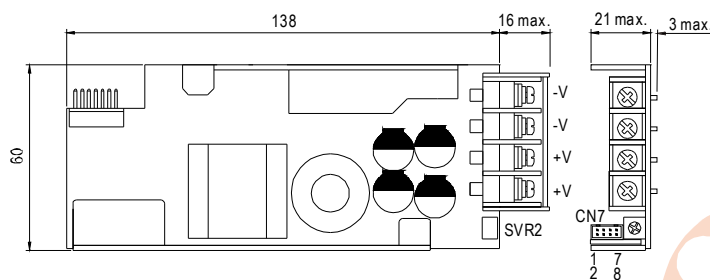


Output Connector(CN20) : JST B4B-XH or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	+S: +Remote sensing	JST XHP or equivalent	JST SXH-001T-P0.6 or equivalent
2	-S: -Remote sensing		
3	+RC: +Remote ON/OFF		
4	-RC: -Remote ON/OFF		

Mechanism of Output Modules

©MS-210



Output Connector(CN7) : HRS DF11-8DP-2DS or equivalent

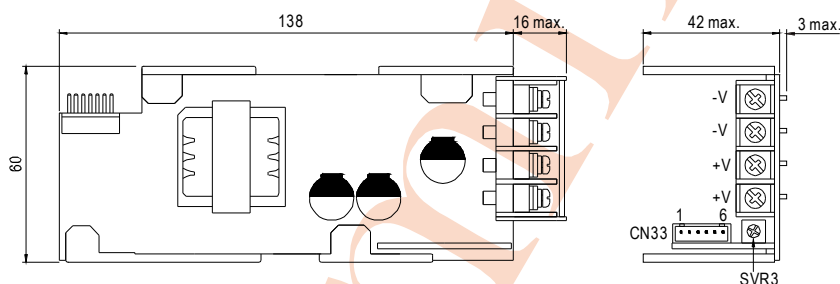
Pin No.	Assignment	Pin No.	Assignment	Mating Housing	Terminal
1	+S: +Remote sensing	5	CS: Current sharing	HRS DF11-8DS or equivalent	DRS DF11-**SC or equivalent
2	-S: -Remote sensing	6	G: GND		
3	+RC: +Remote ON/OFF	7	ML: Margin low control		
4	-RC: -Remote ON/OFF	8	M: Margin control		

NOTE: 1.The voltage difference among each output should be minimized that less than 2% is required.

2.The total output current must not exceed the value determined by the following equation.

$$(\text{Output current at parallel operation}) = (\text{The rated current per unit}) \times (\text{Number of unit}) \times 0.9$$

©MS-300



Output Connector(CN33) : JST B6B-XH or equivalent

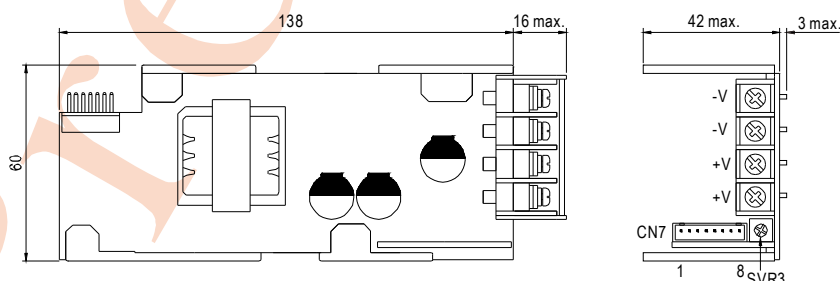
Pin No.	Assignment	Mating Housing	Terminal
1	+S: +Remote sensing	JST XHP or equivalent	JST SXH-001T-P0.6 or equivalent
2	-S: -Remote sensing		
3	+RC: +Remote ON/OFF		
4	-RC: -Remote ON/OFF		
5	P: Current sharing		
6	G: GND		

NOTE: 1.The voltage difference among each output should be minimized that less than 2% is required.

2.The total output current must not exceed the value determined by the following equation.

$$(\text{Output current at parallel operation}) = (\text{The rated current per unit}) \times (\text{Number of unit}) \times 0.9$$

©MS-360



Output Connector(CN7) : JST B8B-XH or equivalent

Pin No.	Assignment	Pin No.	Assignment	Mating Housing	Terminal
1	+S: +Remote sensing	5	CS: Current sharing	JST XHP or equivalent	JST SXH-001T-P0.6 or equivalent
2	-S: -Remote sensing	6	G: GND		
3	+RC: +Remote ON/OFF	7	ML: Margin low control		
4	-RC: -Remote ON/OFF	8	M: Margin control		

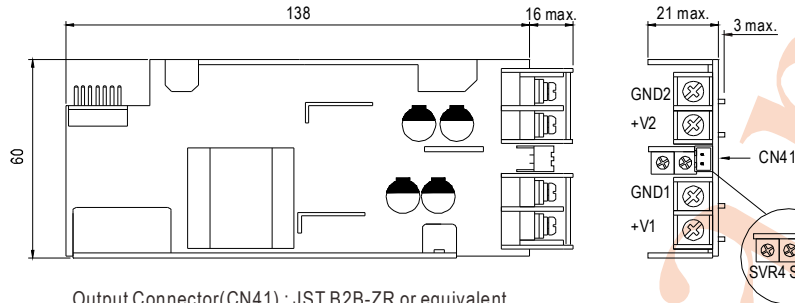
NOTE: 1.The voltage difference among each output should be minimized that less than 2% is required.

2.The total output current must not exceed the value determined by the following equation.

$$(\text{Output current at parallel operation}) = (\text{The rated current per unit}) \times (\text{Number of unit}) \times 0.9$$

Mechanism of Output Modules

©MD-100

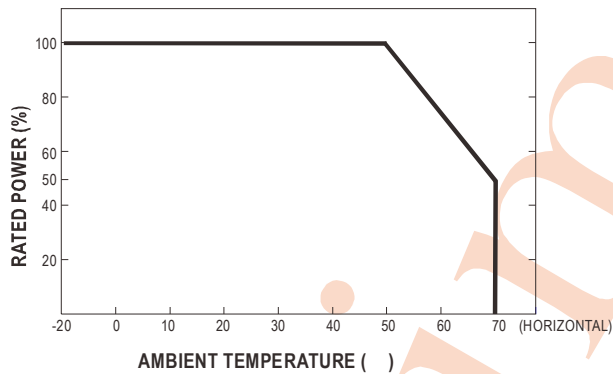


Output Connector(CN41) : JST B2B-ZR or equivalent

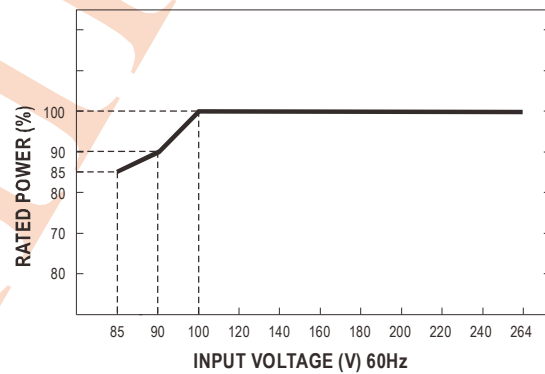
Pin No.	Assignment	Mating Housing	Terminal
1	+RC	JST ZHR-2 or equivalent	JST SZH-002T-P0.5 or equivalent
2	-RC		

NOTE: 1.Remote ON/OFF of CN4 turn ON/OFF the entire power system
 2.Remote ON/OFF of CN20,CN33,CN41,CN51 turn ON/OFF the individual output module
 3.SVR1~5: DC output voltage adjustment(SVR4 for CH2 of MD-100,SVR5 for CH1 of MD-100)

Derating Curve



Static Characteristics



Remote Voltage Adjust

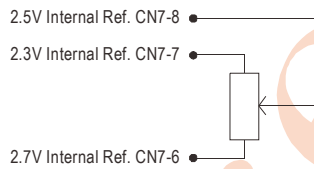


Figure 1

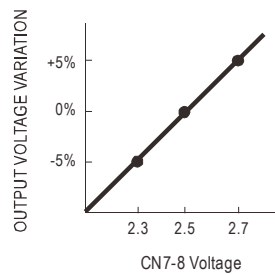


Figure 2

If this function is not required the V Prog (pin CN7-8) is left open circuit and the output voltage will remain at the pre-set nominal. In this configuration the voltage on CN7-8 is fixed at approximately 2.5V. However, connecting pin CN7-8 directly to either CN7-6 or CN7-7 will increase or decrease the voltage on CN7-8, to approximately 2.7V or 2.3V. This will change the nominal o/p voltage by +/- 5% respectively. Additionally, connecting a 100K Potentiometer across CN7-6 and CN7-7, see fig 1, will allow a linear adjustment of the nominal o/p voltage by approximately +/-5%, see Fig 2.