Product Specification

Created: May 1, 2013

Scope

This specification applies to built-in DC stabilized power supply, mOZP-350-12-**E*-*, mOZP-350-24-**E*-*, mOZP-350-30-**E*-*, mOZP-350-36-**E*-*, and mOZP-350-48-**E*-*.

This power supply provides DC output at AC input instantaneous power failure by connecting the dedicated capacitor package (380 VDC).

In addition, all items in this specification shall be provided at nominal temperature and humidity unless otherwise specified.

Model Name Coding

Example: $\underline{mOZ} \ \underline{P} - \underline{350} - \underline{24} - \underline{J} \ \underline{S} \ \underline{E} \ \underline{C}$ \underline{C}

- ①Series Name·····"mOZ": mOZ series
- ②Peak power "P": Corresponding to Peak power
- (3) Continuous output power·····"350": 350W (300W for 12V output type)
- @Output voltage "12": 12V, "24": 24V, "30": 30V, "36": 36V, "48": 48V
- ⑤Input / output connector type·····"J": Nylon connector, "T": Block terminal
- (6) Current balance function. ""O": Without current balance function, "S": With current balance function
- ①Low standby power·····"E": Low standby power type (at RC signal OFF)
- ®Modification "Blank": Standard, "1 to 9" or "A to Z": Modification symbol

General Specification

				S	pecificatio	n			
į	Item	S			mOZP-350	.		Measurements	
			12	24	30	36	48	conditions, etc.	
	Rated Voltag	ge	100-240V	\C				Worldwide range	
	Voltage Ran	ge	85-264VA	C	Load factor shall be 90-100% in range of 85-95VAC input				
	Current	At 100VAC	3.3A typ.	3.8A typ.				At rated output (Natural air cooling)	
		At 100VAC	4.8A typ.	5.5A typ.				At rated output (Forced air cooling)	
		At 200VAC	1.7A typ.	2.0A typ.				At rated output (Natural air cooling)	
AC			2.5A typ.	2.9A typ.				At rated output (Forced air cooling)	
E	Rated Freque		50/60Hz 14A typ.		Frequency range 47-63Hz				
Input	Inrush	Inrush At 100VAC			At voted output				
	Current	At 200VAC	28A typ.					At rated output	
	Efficiency	At 100VAC	90% typ.	92% typ.				A. 2001711 1	
	Efficiency	At 200VAC	92% typ.	94% typ.				At 300W load	
1	Power	At 100VAC	99% typ.					At rated output	
l	Factor	At 200VAC	96% typ.					(Natural air cooling)	
	Standby	At 100VAC	60mW typ	•				Power consumption at RC	
l	Power	At 200VAC	200mW ty	р.	signal OFF				
	Holding Tim	e	22msec ty					At 300W output	
		Momentary	70VAC / 5					At rated load (350W)	
	Fluctuation		40VAC / 1	00msec			9-4	At 70% load (245W)	
Note	<u>.</u> :							्रिप होंगे	

Note:

出図) 20x10,19 機ニプロン 技術管理

Drawn by Ishikashi Checked by Yamada Approved by Model: mOZP-350-**-*	*E*-* Drawing No. 3222-01-4-520
---	---------------------------------

			Specification	
	Item	s	mOZP-350-	Measurements
	2011		12 24 30 36 48	conditions, etc.
	l	Natural Air	-10 to 60°C (Open frame)	Refer to "Output derating
	Operating	Cooling	-10 to 55°C (With chassis and cover)	specification".
	Temp.	Forced Air	-10 to 70°C (Open frame)	Refer to "Output derating
		Cooling	-10 to 70°C (With chassis and cover)	specification".
E	Operating H		20 to 90%RH	
<u> </u>		p. / Humidity	-20 to 75°C / 10 to 95 %RH	There shall as a send as at 's
701	Storage Telli	p. / mumany	To endure the vibration acceleration of 2G with vibration	There shall no condensation Follow JIS-C-60068-2-6
Environment	Vibration		frequency of 10 to 55Hz for 10 sweep cycles in each X, Y, Z direction.	At no operation
			Left one bottom edge of the unit 50mm high with the opposite edge placed on the test bench, and let it fall.	Follow JIS-C-60068-2-31 At no operation
	Surface Drop	pping	Repeat 3 times for each of four bottom edges, and no malfunction shall be observed.	At no operation
4]		4kVAC/1min between input and output /RC/AC FAIL	Cut-off current 10mA
Insulation	Dielectric Str	ength	4kVAC/1min between input and FG	Cut-off current 10mA
lati	Blokeon to Sta	ongui	500VAC/1min between each	
on			input/output/RC/AC_FAIL/FG	
	Insulation Re		50MΩ min. between each input/output/RC/AC_FAIL/FG	At 500 VDC
	Leakage Cur	rent	Please refer to page 8	
	Electrostatic	discharge	IEC61000-4-2 test level 3 compliant (Contact discharge: ±6kV, 10 times)	Apply to FG and case. There shall be no malfunction, nor failure.
	Line noise in	nmunity	±2000V (pulse width of 100/1000nsec, cycle period of 30 to 100Hz, Normal/Common mode with Positive/Negative polarity for 10 minutes)	To be measured with INS-410. There shall be no output voltage fluctuation in DC component nor malfunction.
	Impulse volta immunity	age	IEC-61000-4-5 (Installation environment 3, 4) compliant; apply 5 times each of Common mode ±4kV and Normal mode ±2kV	There shall be no malfunction, nor failure.
0	Conducted er		VCCI, FCC, CISPR22, and EN55022 Class B compliant	At rated Input and output (Natural cooling), with chassis*
Othe	Harmonic cu	rrent	IEC61000-3-2 (edition 2.1) class D,	At rated input and output
ers	regulations		EN61000-3-2 (A14) class D compliant. UL60601-1,CSA C22.2 NO.601.1(c-UL), ANSI/AAMI ES60601-1	IEC60601-1 2nd and 3rd (MOPP)
	Safety Standa	ard	UL60950-1,CSA60950-1(c-UL),CE marking(IEC62368-1)/	
	Saroty Starrag		CECOPSO 1,CONTOUSSO I(O-OES),CES MAIRING(IECOZSOO-1)/2	PSE (Ordinance item 2) compliant
l	Cooling syste	em	Natural air cooling	
	Dimensions a	and Weight	95×44×222 (W×H×D) / 650g typ.	Without Chassis and Cover
Ì	Dimensions &	TITE WOISH	107×57×252 (W×H×D) / 1050g typ.	With Chassis and Cover
	Warranty		Three years after delivery: if any defects belong to us, the defective unit shall be repaired or replaced at our cost.	The unit shall be operated at normal temperature and humidity. Except for lifetime of electrolytic capacitors due to operating environment.
Note	: *For the red	duction of radia	ted noise, the input harness "WH-C05VH-800-02" (with ferrit	
	5(FG) 3(N) 1(L)			2019.10.02 Nakagawa I-310937 2020.06.15 Nakagaw <u>a I</u> -310937B
			<u> </u>	The state of the s

| Pakibashi | Pa

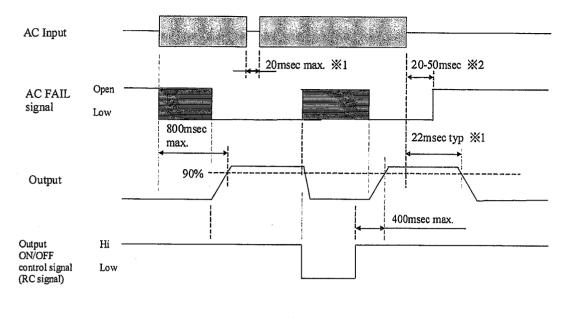
Οu	tput Spe	cifica	tion								20 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -				
						Specific					Measurement conditions,				
	Ite	ms				mOZP					etc.				
	15. 15.	1.		12	24	30)	36		48					
	Continuo rating	Continuous ating natural air		ontinuous ting Curren				12V 25A	24V 14.6A	30V 11.7A		36V 9.8A		SV BA	At rated input Refer to "Output derating specification"
Ō	cooling)		Power	300W	350.4W	351W		352.8W	7 35	0.4W	Specification				
dar	Continuo	us	Current	36A	21.0A	16.8A	-	14A		.5A	-				
Output Rating	rating (forced ai cooling)	r	Power	432W	504W	504W		504W		4W					
gai	3/		Current	42A	25A	20A		16.7A	12	.5A	At rated input/output.				
a.c		ating		Peak rating 10 seconds or		504W	600W	600W		601W		ow	Refer to "Peak output specification" Natural cooling and forced cooling.		
	Factory se	etting		12V±2%	24V±2%	30V±2	%	36V±29	6 48	V±2%	At rated output				
	Adjustabl	e volta	ge range	12V±10%	24V±10%	30V±1	0%	36V±10)% 48	V±10%	At more than rated voltage setting, Use it within rated output power.				
	Static inp	nt reon	lation	48mV	94mV	120mV	7	144mV	19	2mV					
5	Otatio inp	ut rogu		max.	max.	max.		max.	ma						
Output Characteristics	Static load	-		100mV max.	150mV max.	180mV max.	7	220mV max.	30 ma	0mV ix.					
Jh2	Temperati	ire regi	liation	0.02%/°C r	nax.			•	1.5	037	0170				
aracte	Ripple	0 t	o 70°C	120mV ma					ma	0mV ix. 0mV	Connect 150mm max. lead wire to output connectors, and then connect a 10µF				
ristics	voltage	-10	0 to 0°C	160mV ma	X.		··· · · · · · · · · · · · · · · · · ·		ma		electrolytic capacitor with a 0.1 µF ceramic capacitor in				
		0 t	o 70°C	150mV ma	х.	V 40-20-000-00-00-00-00-00-00-00-00-00-00-0			25 ma	0mV ix.	parallel to the other ends of the wires to measure by an				
	voltage	Spike voltage -10		180mV max. 400mV max.							oscilloscope with 100MHz frequency band. At rated output*				
	<u> </u>	-	CP point	101% min of neak rated current							Tit I acou output				
Pr	Overcurren	4	ethod	101% min. of peak rated current Hold-down current limiting → Blocking oscillation											
tec	protection	<u> </u>	covery			ing — bi	OCKI	ig oscina	11011						
Protection Circuit	Overvoltag	70	/P point	13.8-16.2 V	1 1			43.2-49 V	.4 56 V						
rcu	protection		thod	Output shut	down	•									
₩.	1		covery	Reclosing of	f AC input or	RC sign	al OI	$F \rightarrow ON$	Ţ						
B	By connec			0	-1	0	utput	power at	backup o	peration	(note) The backup time				
ack	dedicated package (s			Capacitor pa	ckage model n	ame	0W	100W	200W	350W	shown left is indication				
dmy	with the d			BS13A-EC4	00/422F		2.1	1.1	0.55	0.26	value, not guaranteed				
ds.	connection				: 1 minute typ.		ec.	sec.	sec.	sec.	value,				
eci.	separately) to CN	I3, the			·									
fica	output pov								}						
Backup specification	following	backup during the following time at AC input failure.													
Not	e. *The	rippl	e and s	pike voltag	e at 70W o	utput sl	hall	be 200r	nV/400	mV ma	(出図)				
											2 to 10, 19				
Drawn by		Checked	,	Approved yamamo	Model:	3 E O 44	بار ب	ید بد	Drawing		(株) ニプロン 技術管理				
<u>n</u>	Ishibashi	면 y	'amada	g yamamo	6 mOZP-3	JDU-**-	·°°E'	~_~	5222	-01-4	-520				

3/11

Sign	nal Input/Output specif	ication	n	The said shake an arrange						
			**	pecification	on		Signal Innut/Outrat signal In			
	Items		n	10ZP-35)-		Signal Input/Output circuit diagram /Other			
		12	24	30	36	48	7 Other			
	Output ON/OFF control signal (RC signal)	E	ating mode Between +RC SW ON (4.5V	min.)	Output		Circuit diagram Power supply +RC SW R			
Input signal	Shorting Plug With shorting plug (CN2) connected, output starts up when AC input is applied regardless of RC signal. To control Start/Stop of output by RC signal, uncap shorting plug of CN2.						Note: Shorting plug (CN2) and radiating fin next to it are primary circuit components. Make sure to operate the plug after the AC input is turned off.			
	Remote Sensing signal (RS signal)	Conne it shall such a	terminal for d ecting RS sign I compensate s output cable	nal to posit line-drop a e.	ive side of o	levices,				
	Current balance signal (CB signal) *Only for "mOZP-350-**-*SE*-*"	During termin	terminal on cu g parallel ope als of each po	ration, con ower suppl	nect CB sig y.	Total output current at connecting N units in parallel shall be within "rated output current x N x 0.9" A. (N≤5)				
	Voltage balance signal (VB signal) *Only for "mOZP-350-**-*SE*-*"	For pa	erminal on vorallel operation als of each posterior	on, connec	t VB signal	Higher VR setting value of output voltage shall be preferential				
Output signal	Blackout detection signal (AC_FAIL)	voltage Undefi Detect	gnal goes "Ol e and power f ined at RC sig ion voltage: 8 ion delay tim	failure dete gnal OFF. 30 VAC typ	ection.		Circuit Power supply +AC_FAIL 3mA max 30Vdc max -AC_FAIL			
signal	LED drive output	operati light. The LF circuit fail, or control connec	rs "Hi" when ing and an extended and ing and an extended and ing and ing and ing and ing condition and condition and ing	off during, such as ci on by "outparallel op- diode to the	on PCB we main inverted the main inverted to main inverted to main main main main main main main main	Open voltage: 12V typ. Max current: 7mA max. (Built in 1.7 kΩ or equivalent)				
Note							2010.19 (梯ニプロン) 技術管理			

Drav		Checl		Appro		Model:	Drawing No.	1
M G	Ishibashi	ked b	Yamada	oved b	yamamoto	mOZP-350-**-**E*-*	3222-01-4-520	
`		У		У			4/11	

• Sequence Timing diagram (Without Capacitor Package)



:

:Undefined area

※1: Rated input, 300 W output.

2 : If the output power is less than 10%, the input voltage is the maximum 150msec in the range of AC150V or more.

•Peak output specification

Peak output current shall meet the conditions below.

- Duty ratio of peak current shall be 45% or less.
- Energized period of peak current shall be 10 seconds or less.
- In the case that the ambient temperature is 50°C or higher with natural air cooling, the energized period of peak current shall be 5 seconds or less.
- The value resulting from the formula below shall not exceed the continuous rated current, Io, after derating specified in "Output derating" item.

$$\sqrt{((Ip^2 \times D) + (Im^2 \times (1-D)))} \le Io$$

Ip=Peak current value

Im=Min. current value

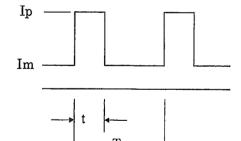
D=Duty ratio, t/T

t=Pulse width of peak current

T=Cycle

Io=Continuous rated current specified in

"Output derating" item



Note



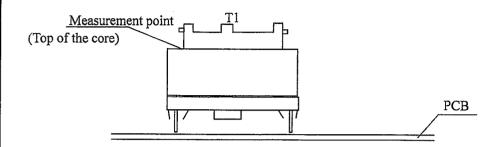
Drawn by	Ishibashi	Checked by	Yamada	Approved by	yamamoto	Model: mOZP-350-**-**E*-*	Drawing No. 3222-01-4-520
				Y			5/11

Created: May 1, 2013 Output derating based on ambient temperature, installation direction and cooling condition Follow the derating diagram below for output according to the ambient temperature and installation direction. In addition, for the unit with chassis and cover, input voltage shall be 90V or higher. Also, forced air cooling condition in the diagram shall be provided that the air flow of 1.5 m/s is applied from the direction shown below. CN1 CN1 mamma (A) 1.5m/s (F) (B) The air flow of forced air cooling **Output derating** OZP-350-12 OZP-350-24, -30, -36, -48 550 550 500 500 (1.5 m/s)450 450 400 Output Power (W) 400 For Open frame 350 350 Output Power 300 300 250 250 Naturalairo (8.D) 200 200 Natural air cooli 150 150 100 (E.F) 100 (E.F) 50 50 -10 10 30 40 -10 10 30 Ambient Temperature (°C) Ambient temperature (°C) 550 550 500 500 450 450 With chassis and cover 400 Output Power (W) 400 Output Power (W) 350 350 300 300 250 250 200 200 150 150 100 100 50 50 (D.E.F) 0 20 30 -10 10 30 60 40 Ambient Temperature (°C) Ambient temperature (°C) Note 技術管理

Dra		Che		Appı		Model:	Drawing No.
wn b	Islibashi	cked	Yamada		yamamoto	mOZP-350-**-**E*-*	3222-01-4-520
у		bу		by			6/1

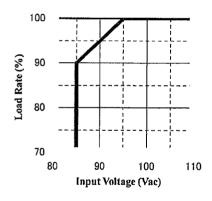
Guideline for forced air cooling

Set the core surface temperature of the transformer (T1) to 80°C or lower.



Output derating vs. Input voltage

When input voltage is 95VAC or lower, follow the derating diagram below to reduce the continuous rated current and power.



Note



Dra		Che		Appı			Drawing No.
wn b	Ishibashi	ked I	Yamada	oved l	yamamoto	mOZP-350-**-**E*-*	3222-01-4-520
٧		bу		bу			7/11

Parallel operation precautions

By connecting the outputs of "N" power supplies in parallel, output capacity "rated output x N units x 0.9" will be obtained. ($N \le 5$) In this case, please note the points written below.

Created: May 1, 2013

(Connection)

- •Please connect the dedicated cable (Model name: WH-02PH02PH-200) between the connectors "CN13" or "CN14" on the PCB of both power supplies connected in parallel. By connecting between these connectors, output current balances for each power supply are controlled to be equal.
- •Load wires from each power supply should be wired to make both impedance equal as much as possible.

(Output voltage adjustment)

• When adjusting the output voltage, set either one of the output voltage adjusting knob to the minimum (to the leftmost), and adjust the output voltage using the output voltage adjusting knob of the other power supply.

(Temperature increase)

• There might be heat increasing caused by installation interval, direction, and any shielding materials around power supply units when you connect in parallel. To avoid the heat increasing, please check temperature increasing with equipping actual device and operating. In case of the temperature of transformer (T1) exceeds 80°C (indication value), please change the installation interval, direction, or cut down the output power to reduce the heat.

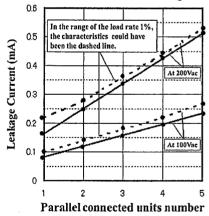
(LED indication)

•LED on the PCB light green when the main inverter circuit is operating. It blacks out at circuit failure, at AC input failure, or when the main inverter circuit stops by turning off the "Output ON/OFF control signal".

(Leakage Current)

• Please refer to the below for the leakage current value at parallel connecting.

Parallel connected units and leakage current

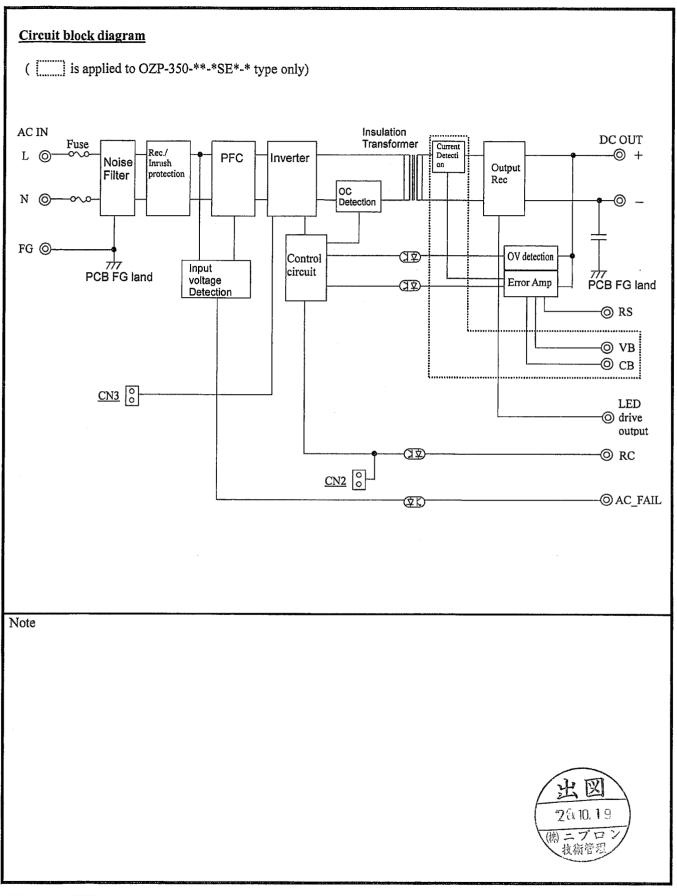


(Others)

Note

• Because it does not include O Ring diode in the output terminal, output power does not remain when one of the power supplies is damaged due to short mode etc. In addition, output power does not remain normally when power supply in operation is connected to the one in shutdown condition in parallel.

| Tawn by | Ishibashi | Check by | Yamada | Yamamolo | Model: mOZP-350-**-**E*-* | 3222-01-4-520 | 8/11

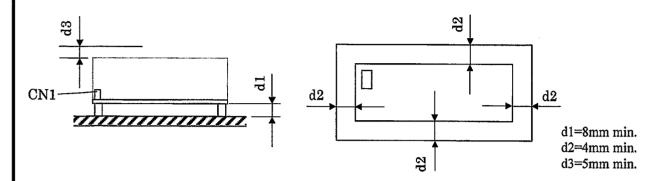


Dra		Che		App		Model:	Drawing No.	
wn b	Ishibashi	cked	Yamada	roved	yamamoto	mOZP-350-**-**E*-*	3222-01-4-520	l
٦۶		by		by			9/11	

Created: May 1, 2013

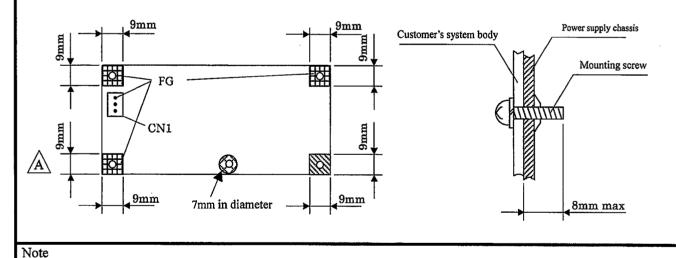
●Power supply installation

- To meet the standard of Insulation and dielectric withstanding, install the power supply to keep the dimensions, d1, d2, and d3, shown in the drawings below.
- Install the power supply so that natural air convection and air ventilation are expected to keep the temperature rise around the power supply low.



■ Mounting screws and grounding of power supply

- Fix all 5 screws firmly at power supply mounting holes.
- Use 3mm diameter screws for mounting power supply.
- * Do not use the metal mounting parts that exceed the hatched area shown below.
- In mounting the unit with Chassis and Cover, do not use any screws that exceed the area shown below.
- Make sure to connect FG terminal of CN1 or FG portion of PCB to customer's safety grounding. Also, make sure to connect FG terminal of CN1 to the safety ground of the customer's system in the case of safety standard application.
- Be recommended to connect the FG portion of solder face of PCB to customer's metal system body with metal parts such as metal spacers to reduce noise.



.

× 1:2016.07.05 M.Okudaira

出図
26 10, 19
機ニプロン技術管理

Drawn	Ishibashi	Checke	Yamada	Approve	vamamoto	Model: mOZP-350-**-**E*-*	Drawing No. 3222-01-4-520 A	
ьy	13/1/1000/11	d by	14114444	d by	yamamoto	MOZI -3330 E -	10./1	11

Precautions before use

1.Grounding- \(\frac{\lambda}{\text{Warning}}\)

This unit is designed and produced to meet Class 1 equipment. Make sure to connect the grounding terminal of the unit to grounding in a proper way for safety.

2.Electric shock - A Warning

This unit is designed and produced as built-in equipment and has high-voltage part inside. Make sure to securely install in the equipment in a proper way to prevent electric shock. Also, shorting plug (CN2) for RC signal setting and radiating fin next to it are primary circuit components. When the plug is handled, make sure to turn off AC input before the handling of the plug.

3.PCB handling - \(\Delta\) Caution

In handling, use the edge of the PCB so as not to touch the component sides. Lift the PCB from the equipment with filter pieces in installation. Besides, handle the PCB with care to prevent twisting or bending of the PC board as it has SMT components on it.

4.Output short circuit - \(\Delta\) Caution

Prevent shorting outputs. When output is shorted, capacitors inside the power supply rapidly discharge leading to fire and/or spark resulting in serious accident. It also shortens the lifetime of the power supply.

Applying external voltage to power supply's output terminal, parallel connection of output power without connecting voltage and current balance signal (CN13 or CN14), parallel connection of power supplies with different output (12V output and 24V output power supplies etc.) may lead to the failure of power supply.

6.Inrush current control circuit - A Caution

A register with thermal fuse is used to limit the surge current which flows into rectifying capacitor at AC input. In case of repeating AC input and the shutoff, the register would produce heat and the thermal fuse could have been fused.

7.Output energy - \(\bigau \) Caution

The output energy of this unit is 240VA or more, and regarded as dangerous. Any operators must not touch the unit. Besides, apply necessary measures to prevent service personnel or service tools to touch accidentally the equipment with this unit installed. Make sure that the output voltage of this unit goes down to the safe level before servicing after the input voltage is turned off.



Created: May 1, 2013

Dra		Che		Appr		Model:	Drawing No.
Ψ'n	1shibashi	cked	Yamada	oved	yamamoto	mOZP-350-**-**E*-*	3222-01-4-520
by		ьу		by			11/11

