

Single Output Power Supply UZP-220 series

Ultra-high efficiency 94%
Various outputs (+12V, +18V, +24V, +48V) with 220W lined up



With battery package connected to UZP-220-**-**B*, backup at blackout is available.



■ Battery Package BS28A-H350/2.5L

Single Output	
Continuous	Peak
180W~	400.8W~
220.8W	401.4W

RoHS Directive

Structure and I/O connector	Model	Output voltage	Output current *1	Output power *1
Open frame type/ Nylon connector	UZP-220-12-JBE	+12V	15A (33.4A)	180W (400.8W)
	UZP-220-18-JBE	+18V	10A (22.3A)	180W (401.4W)
	UZP-220-24-JBE	+24V	9.2A (16.7A)	220.8W (400.8W)
	UZP-220-48-JBE	+48V	4.6A (8.35A)	220.8W (400.8W)

Structure	Model
With chassis	'C' is added after open frame model name (Ex: UZP-220-12-JBE-C)
With chassis and cover	'K' is added after open frame model name (Ex: UZP-220-12-JBE-K)
Input/Output connector type	Model
Block terminal	'J' in the nylon connector model become 'T' (Ex: UZP-220-12-TBE)

■ Model name coding

① Series name	④ 12:12V	⑤ S05:5VSB output	⑦ 0:Without backup function	⑨ Modification
② Peak output	18:18V	S12:12VSB output	B:With backup function	⑩ Blank/Without chassis and cover
③ Output power	24:24V	Blank/Without SB output	⑧ Reduction of standby power:	C:With chassis
	48:48V	⑥ Input/Output connector	E:Reduction of standby power	K:With chassis and cover
		J:Nylon connector	function equipped	
		T:Block terminal	(at RC signal OFF)	

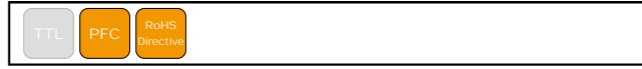
*1 Values in () above show peak current and power.

Features

- Blackout backup is possible.
- Low standby power (at RC signal OFF, 0.02Wtyp/100VAC, 0.09Wtyp/200VAC)
- Support ErP directive Lot6 at standby power output equipped type.
- Equipped with a variable resistor to adjust output voltage.
- It is not necessary to provide a noise filter on the outside.
- Low leakage current is also realized.

Safety standard	UL	CSA	EN	CE	CCC
Reliability grade	HFA	FA	HOA	OA	

Function



Input

AC input	85-264 VAC (Worldwide range)
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*Some DC input-only types are also available. (Please contact us for details.)

Dimension

WxHxD (mm)	Without chassis and cover	75x36x160
	With chassis and cover	83.8x45x188

An amazing high level of efficiency 94% has been achieved for a 24 V output type.

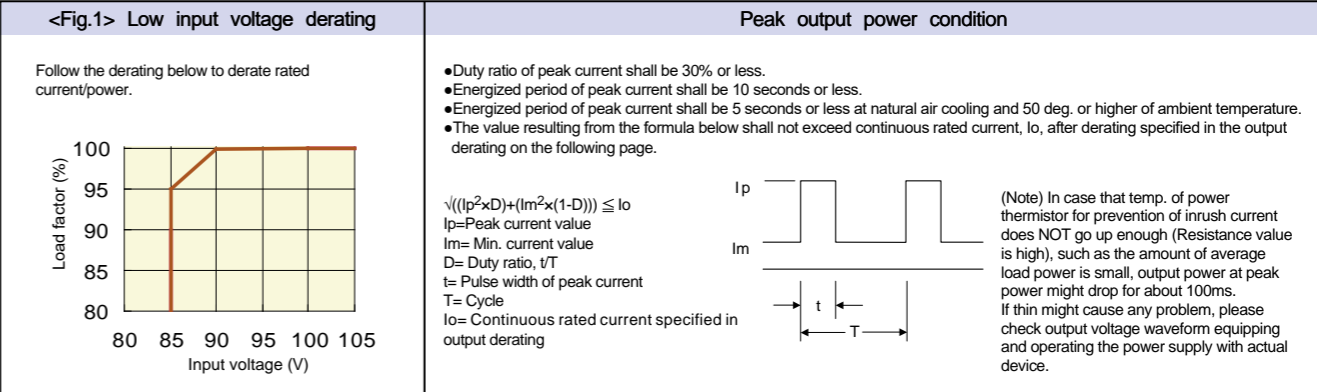
(*At 230VAC input, 220W load)

Peak power 400 W output, approx. over 1.8 times higher than continuous rated.

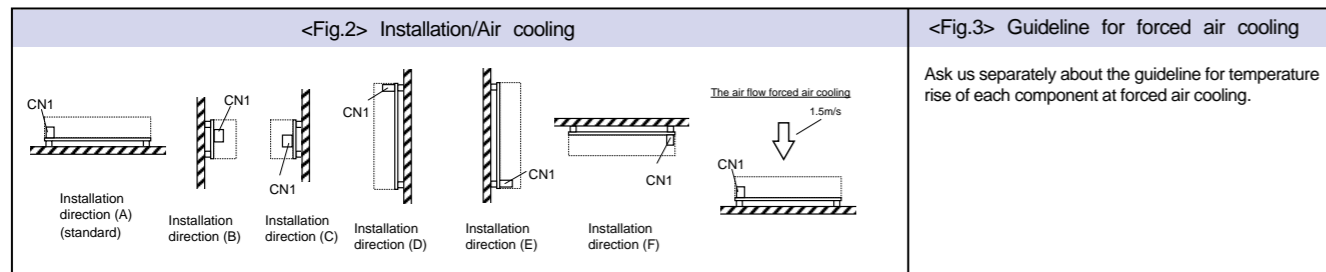
Standby power output (5VSB/12VSB) equipped model is also added.

General Specification (Items are provided at normal temperature and humidity unless otherwise specified.)

Items	Specification	Measurements conditions, etc.				
AC Input	Rated Voltage	100-240VAC (85~264VAC)	Worldwide range *See <Fig.1> Low input voltage derating below.			
	Input Frequency	50-60Hz	Frequency range 47-63Hz			
	Efficiency	100VAC 90.0% typ (12V/18V output), 91.5% typ (24V/48V output) 200VAC 92.0% typ (12V/18V output), 93.5% typ (24V/48V output)	At 180W output (natural air cooling) *Characteristic data: Fig.5			
	Power Factor	100VAC 99% typ 200VAC 90% typ	*Characteristic data: Fig.6 At rated output (natural air cooling)			
	Inrush Current	17A typ (100VAC), 34A typ (200VAC) *Characteristic data: Fig.7	Power thermistor system at cold start (25°C)			
	Input Current	100VAC 2.1A typ (at 12V/18V output, natural air cooling), 2.4A typ (at 24V/48V output, natural air cooling) 200VAC 3.0A typ (at 12V/18V output, forced air cooling), 3.8A typ (at 24V/48V output, forced air cooling) 1.1A typ (at 12V/18V output, natural air cooling), 1.2A typ (at 24V/48V output, natural air cooling) 1.6A typ (at 12V/18V output, forced air cooling), 1.5A typ (at 24V/48V output, forced air cooling)	*Characteristic data: Fig.5 At rated output			
Output	Model	UZP-220-12	UZP-220-18	UZP-220-24	UZP-220-48	
	Rated Voltage	+12V	+18V	+24V	+48V	
	Continuous Rated Output1 (natural air cooling)	15A	10A	9.2A	4.6A	At rated input
	Continuous Rated Output2 (forced air cooling)	180W	180W	220.8W	220.8W	Refer to <Fig.4> output derating on the following page.
	Peak Current/Power	21A	14A	13.8A	6.9A	
		252W	252W	331.2W	331.2W	
		33.4A	22.3A	16.7A	8.35A	*Refer to peak output power condition below.
		400.8W*	401.4W*	400.8W*	400.8W*	Natural air cooling and forced air cooling
	Factory Setting	12V±2%	18V±2%	24V±2%	48V±2%	At rated output
	Adjustable Voltage Range	-5%,+10%	-5%,+10%	-5%,+20%	-5%,+10%	At continuous rated output1
	Static Input Regulation	48mV max.	72mV max.	94mV max.	192mV max.	
	Static Load Regulation	100mV max.	125mV max.	150mV max.	300mV max.	
Temperature Regulation	0.02%/°C max.					
Max. Ripple Voltage	0-70°C	120mV max.	150mV max.	150mV max.	Connect 150mm max. lead wire to output connectors, and then connect a 10µF electrolytic capacitor with a 0.1µF ceramic capacitor in parallel to the other ends of the wires to measure by an oscilloscope with 100MHz frequency band.	
	-10-0°C	160mV max.	200mV max.	200mV max.		
Max. Spike Voltage	0-70°C	150mV max.	250mV max.	250mV max.		
	-10-0°C	180mV max.	400mV max.	400mV max.		
Protection	Over Current Protection	OCP point (A)	101% min. of peak rated current			
		Method	Blocking oscillation *Characteristic data: Fig.20			
		Recovery	Automatic recovery			
	Over Voltage Protection	OVP point (V)	13.8-16.2V	22.0-26.0V	30.0-35.0V	56.2-63.0V
	Method	Output shutdown (latch lock)				
	Recovery	Reclosing of AC input				
Environment	Operating Temp./Humidity	Open Frame	-10-70°C (at natural air cooling), -10-70°C (at forced air cooling) *20-90%			*<Fig.3> on the next page shows the guideline of forced air cooling. Refer to <Fig.4> output derating.
		With Chassis and Cover	-10-60°C (at natural air cooling), -10-70°C (at forced air cooling) *20-90%			
	Storage Temp./Humidity		-20-85°C/10-95%			There shall be no condensation
	Vibration		To endure the vibration acceleration of 2G with vibration frequency of 10 to 55Hz for 10 sweep cycles in each X, Y, Z direction.			Follow JIS-C-60068-2-6 at no operation
Mechanical Shock		Left one bottom edge of the unit 50mm high with the opposite edge placed on the test bench, and let it fall. Repeat 3times for each of four bottom edges, and no malfunction shall be observed.			Follow JIS-C-60068-2-31 at no operation	
Insulation	Dielectric Strength		3kVAC/1minute between input and output/RC 2kVAC/1minute between input and FG 500VAC/1minute between each output /RC/FG			Cut-off current 10mA Cut-off current 10mA Cut-off current 100mA
	Insulation Resistance		50MΩmin. between each input/output/RC/FG			At 500VDC
	Leakage Current		0.06mA typ (100VAC), 0.12mA typ (200VAC) *Characteristic data: Fig.8			
	Line Noise Immunity		±2000V (pulse width of 100/1000nS,cycle period of 30 to 100Hz, Normal/Common mode with Positive/Negative polarity for 10 minutes)			Measurement by INS-410 There shall be no fluctuation of DC output or malfunction.
EMC	Electrostatic Discharge		EN61000-4-2 compliant			Apply to FG and case. There shall be no malfunction, nor failure.
	Radiated, Radio-Frequency, Electromagnetic Field		EN61000-4-3 compliant			
	Fast Transient Burst		EN61000-4-4 compliant			
	Lightning Surge		EN61000-4-5 compliant			
	Radio Frequency Conducted Immunity		EN61000-4-6 compliant			
	Power-Frequency Magnetic Field Immunity		EN61000-4-8 compliant			
	Voltage dips/Regulation		EN61000-4-11 compliant			
	Conducted Emmission		VCCI-B, FCC-B, CISPR22-B, EN55022-B compliant *Characteristic data: Fig.9, 10			At rated input and rated output (natural air cooling), with chassis
Harmonic Current Regulations		IEC61000-3-2 (edition 2.1) classD, EN61000-3-2 (A14) classD compliant.			At rated input/output	
Others	Safety Standard		UL60950-1, CSA60950-1 (c-UL), CCC (S&E), CE Marking (LVD,EMCD) approved PSE (Ordinance item 2) compliant			
	Cooling System		Natural air cooling/Forced air cooling			
	Output Grounding		Capacitor grounding			
	Output Hold-up Time		AC cut-off → 90% of rated voltage within 16ms min.			At rated input, output: 200W (at 24V, 48V), 180W (at 12V, 18V)
	Reliability Grade		FA (Industrial equipment grade to use double-sided PWBs with through holes)			Following our standard
	Weight		310g typ (without chassis and cover), 530g 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.			Except for errors caused by operation not specified in this specification.	

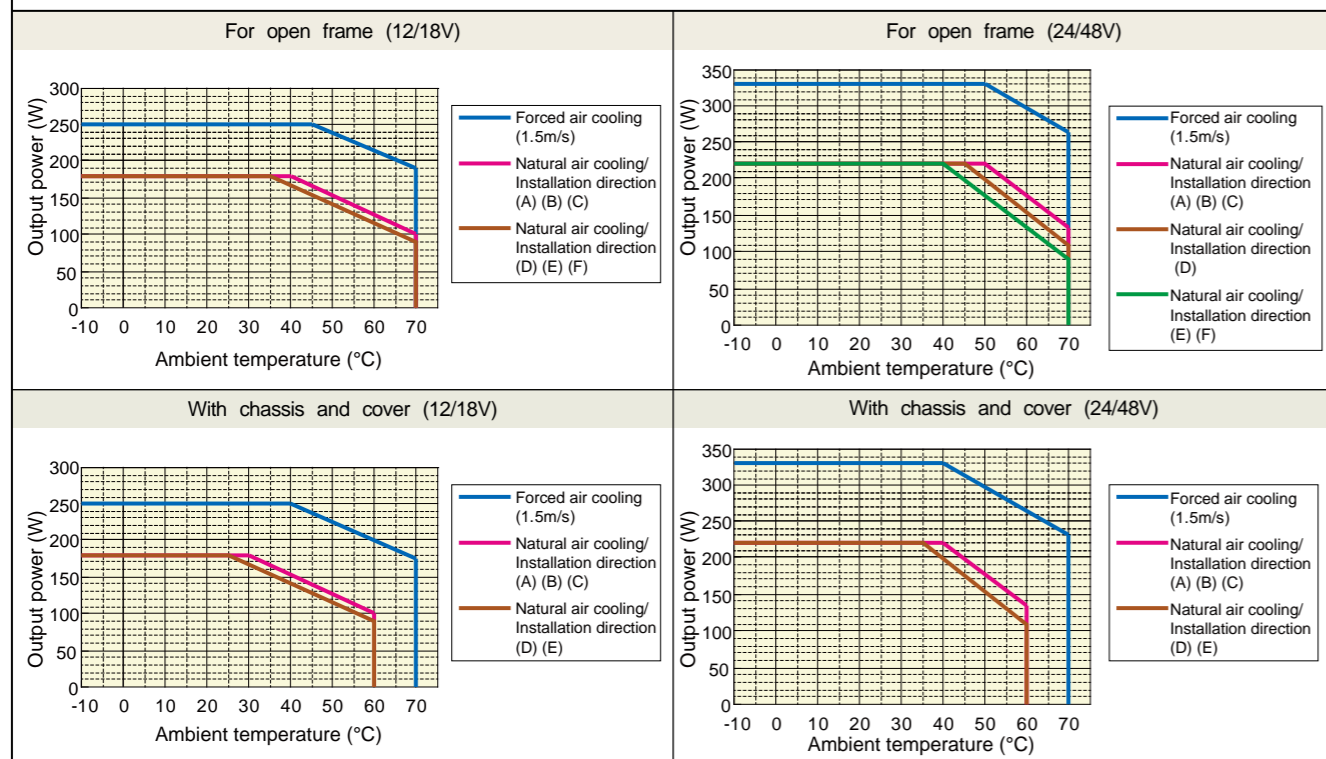


General Specification (Items are provided at normal temperature and humidity unless otherwise specified.)



<Fig.4> Output derating

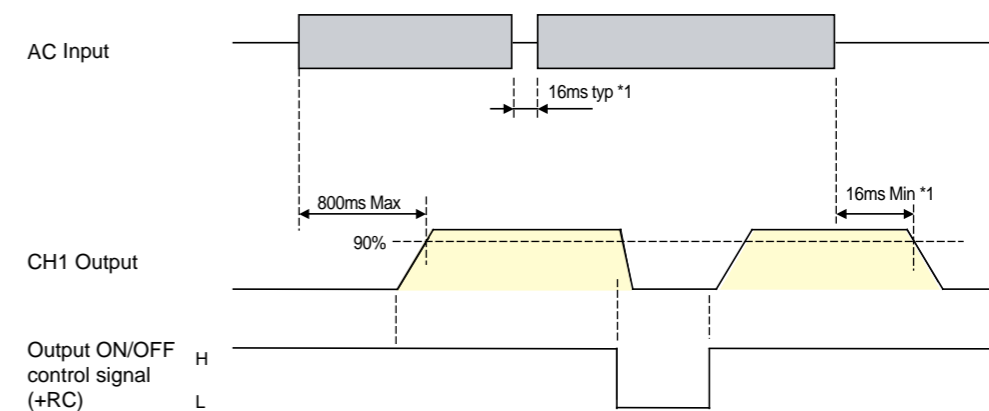
Follow the derating diagram below for output according to ambient temperature and installation direction. In case of using the type with chassis and cover, input voltage range shall be 90 VAC or higher, and shall not use in direction (F). Also, forced air cooling condition in the diagram shall be provided that the air flow of 1.5 m/s is applied from the direction shown <Fig.2>.



Signal Input/Output Specification (Items are provided at normal temperature and humidity unless otherwise specified.)

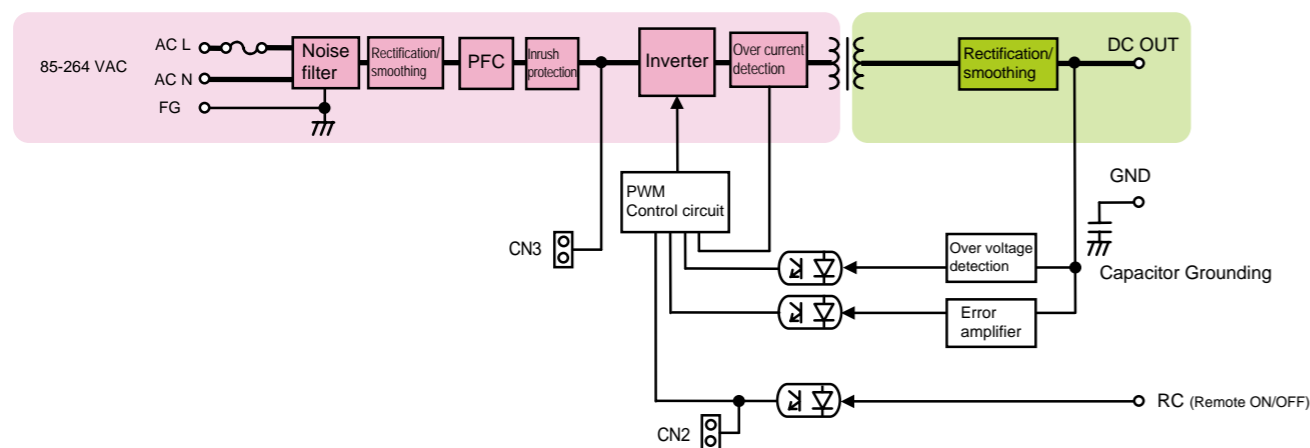
Items	Specification	Note								
Input Signal	Output ON/OFF control signal (RC signal) *Remove the shorting plug of CN2 in using RC signal.	<table border="1"> <tr> <th>Operating mode</th> <th>External power supply and Load-limiting resistor</th> </tr> <tr> <td>Between +RC and -RC</td> <td>Output</td> </tr> <tr> <td>SW ON (4.5V or higher)</td> <td>ON</td> </tr> <tr> <td>SW OFF (0.8V or lower)</td> <td>OFF</td> </tr> </table>	Operating mode	External power supply and Load-limiting resistor	Between +RC and -RC	Output	SW ON (4.5V or higher)	ON	SW OFF (0.8V or lower)	OFF
	Operating mode		External power supply and Load-limiting resistor							
Between +RC and -RC	Output									
SW ON (4.5V or higher)	ON									
SW OFF (0.8V or lower)	OFF									
Input Signal Circuit	<p>(RC signal) Connection example: using external power supply</p>	<p>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) is primary circuit components. Make sure to operate the plug after the AC input is turned off.</p>								

Sequence Timing Chart



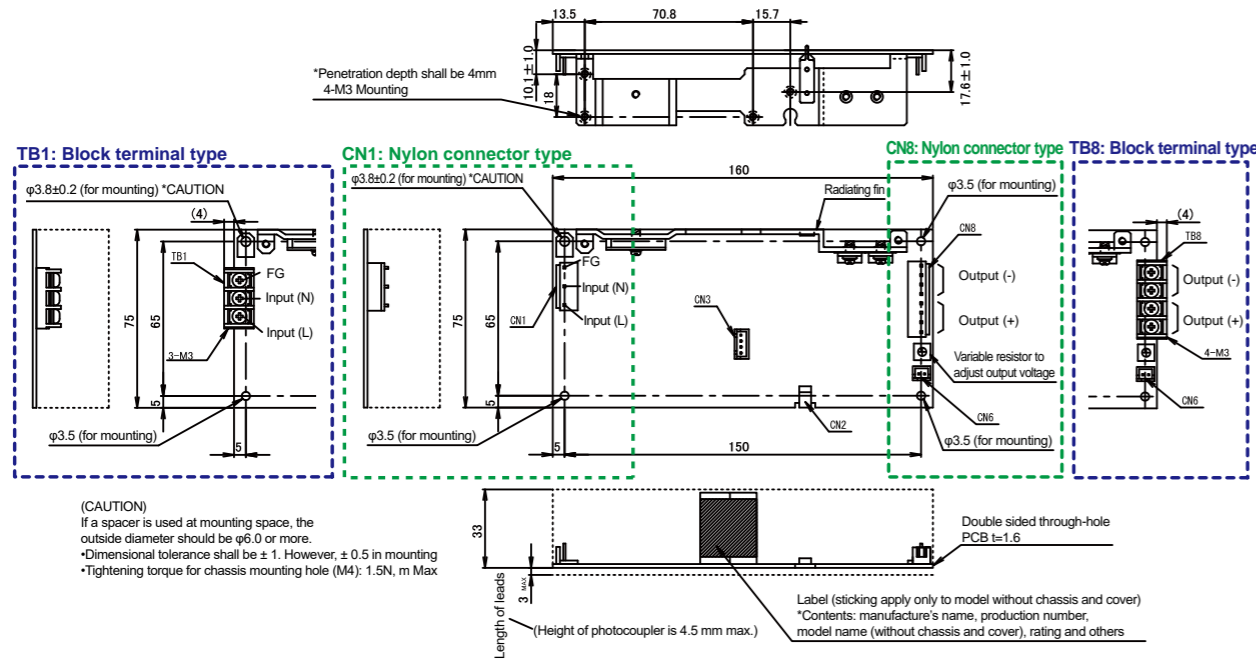
*1 At rated input, output: 200W (at 24V, 48V) / 180W (at 12V, 18V)

Block Diagram

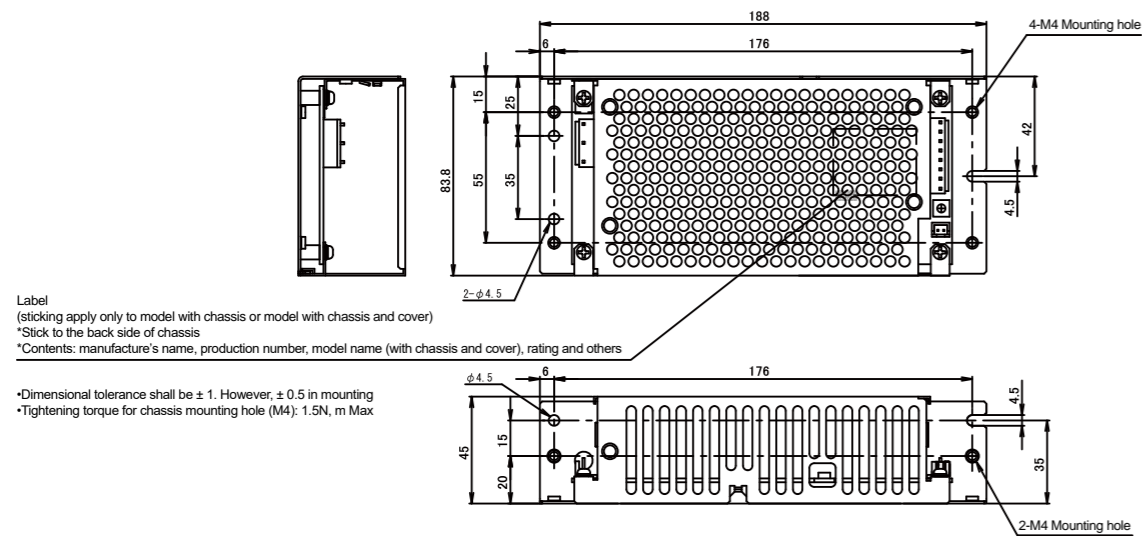


Outline Drawing

PCB type (open frame) model



Model with chassis and cover (Block terminal is also available)



Connector pin allocation

Nylon connector type		Block terminal type																									
<p>CN1 (Input)</p> <table border="1"> <tr><th>Pin No.</th><th>FUNCTION</th><th>CONNECTOR TYPE</th></tr> <tr><td>1</td><td>ADL</td><td>B3P-VH (JST)</td></tr> <tr><td>2</td><td>ADNI</td><td>B3P-VH (JST)</td></tr> <tr><td>3</td><td>FG</td><td>B3P-VH (JST)</td></tr> <tr><td>4</td><td>Input (N)</td><td></td></tr> <tr><td>5</td><td>Input (L)</td><td></td></tr> </table> <p>*CN1 Applicable housing: VHR-8N (JST) Applicable terminals: Reel: SVH-21T-P1.1(JST) Bulk: BVH-21T-P1.1(JST)</p>	Pin No.	FUNCTION	CONNECTOR TYPE	1	ADL	B3P-VH (JST)	2	ADNI	B3P-VH (JST)	3	FG	B3P-VH (JST)	4	Input (N)		5	Input (L)			<p>TB1 (INPUT)</p> <p>See the upper outline drawing</p>							
Pin No.	FUNCTION	CONNECTOR TYPE																									
1	ADL	B3P-VH (JST)																									
2	ADNI	B3P-VH (JST)																									
3	FG	B3P-VH (JST)																									
4	Input (N)																										
5	Input (L)																										
<p>CN8 (Output)</p> <table border="1"> <tr><th>Pin No.</th><th>FUNCTION</th><th>CONNECTOR TYPE</th></tr> <tr><td>1</td><td>-DC</td><td>B3P-VH (JST)</td></tr> <tr><td>2</td><td>+DC</td><td>B3P-VH (JST)</td></tr> <tr><td>3</td><td></td><td></td></tr> <tr><td>4</td><td></td><td></td></tr> <tr><td>5</td><td></td><td></td></tr> </table> <p>*CN8 Applicable housing: VHR-8N (JST) Applicable terminals: Reel: SVH-21T-P1.1(JST) Bulk: BVH-21T-P1.1(JST)</p>	Pin No.	FUNCTION	CONNECTOR TYPE	1	-DC	B3P-VH (JST)	2	+DC	B3P-VH (JST)	3			4			5				<p>TB8 (OUTPUT)</p> <p>See the upper outline drawing</p>							
Pin No.	FUNCTION	CONNECTOR TYPE																									
1	-DC	B3P-VH (JST)																									
2	+DC	B3P-VH (JST)																									
3																											
4																											
5																											
<p>CN6 (ON/OFF Control)</p> <table border="1"> <tr><th>Pin No.</th><th>FUNCTION</th><th>CONNECTOR TYPE</th></tr> <tr><td>1</td><td>+RC</td><td>B2B-XH-A (JST)</td></tr> <tr><td>2</td><td>-RC</td><td>B2B-XH-A (JST)</td></tr> </table> <p>*CN6 Applicable housing: XHP-2 (JST) Applicable terminals: Reel: SXH-001T-P0.6(JST) Bulk: BXH-001T-P0.6(JST)</p>	Pin No.	FUNCTION	CONNECTOR TYPE	1	+RC	B2B-XH-A (JST)	2	-RC	B2B-XH-A (JST)	<p>CN3 (Capacitor package Input/Output)</p> <table border="1"> <tr><th>Pin No.</th><th>FUNCTION</th><th>CONNECTOR TYPE</th></tr> <tr><td>1</td><td>380VPS</td><td>B4B-XH-A (JST)</td></tr> <tr><td>2</td><td></td><td></td></tr> <tr><td>3</td><td></td><td></td></tr> <tr><td>4</td><td>0VPS</td><td>B4B-XH-A (JST)</td></tr> </table> <p>*CN3 Applicable housing: XHP-4 (JST) Applicable terminals: Reel: SXH-001T-P0.6(JST) Bulk: BXH-001T-P0.6(JST)</p>	Pin No.	FUNCTION	CONNECTOR TYPE	1	380VPS	B4B-XH-A (JST)	2			3			4	0VPS	B4B-XH-A (JST)		
Pin No.	FUNCTION	CONNECTOR TYPE																									
1	+RC	B2B-XH-A (JST)																									
2	-RC	B2B-XH-A (JST)																									
Pin No.	FUNCTION	CONNECTOR TYPE																									
1	380VPS	B4B-XH-A (JST)																									
2																											
3																											
4	0VPS	B4B-XH-A (JST)																									

Options (Sold separately)

Cable Photos	Model	Category	Description
	WH-C05VH-800	Input harness	For nylon connector.
	WH-C05VH-800-01	Input harness (with ferrite core)	For nylon connector.
	WH-C08VH-500	Output harness	For nylon connector.
	WH-02XH02XH-500	Signal harness for RC signal	Connection harness to use output ON/OFF control signal (RC signal).
	WH-03ELP04XH-200	Power harness for connecting the capacitor	Connection harness to connect power supply to capacitor package (BS13A-EC400/422F).
	WH-03XH04XH-350	Power harness for connecting the charging/discharging board	Connection harness to connect power supply to the charging/discharging board (BS27A-P350/12V).
	ACC6198	Shorting connector for startup	Blackout Backup (discharging circuit operation) is available by connect the connector to the charging/discharging board (BS27A-P350/12V).
	WH-09ELP04XH-200	Power harness for connecting the battery pack	Connection harness to connect power supply to battery package (BS28A-H350/2.5L).
	WH-S0610-500	Harness for TTL communication	Harness for automatically shut down at blackout Connect to battery package (BS28A-H350/2.5L).
	WH-S1005-500-02	Harness for RS232C communication	Harness for automatically shut down at blackout Connect to battery package (BS28A-H350/2.5L). *The pin allocation is different from "WH-S1005-500-03". (See P10 for details.)
	WH-S1005-500-03	Harness for RS232C communication	Harness for automatically shut down at blackout Connect to battery package (BS28A-H350/2.5L). *The pin allocation is different from "WH-S1005-500-02". (See P10 for details.)

Capacitor package and Battery package

Photos	Model	Battery	Description	Backup time
	BS13A-EC400/422F	Capacitor package	5 inch bay size	*1
	BS27A-P350/12V	Charging/discharging board for lead-acid battery	Supported a lead acid battery of up to 12V 5Ah	*2
	BS28A-H350/2.5L	Ni-MH	5 inch bay size	*1

*Backup time is just a guideline for first use, and not guaranteed.
*1 The backup time is reference *2 Reference when GS Yuasa's lead-acid battery, PXL12023 is connected

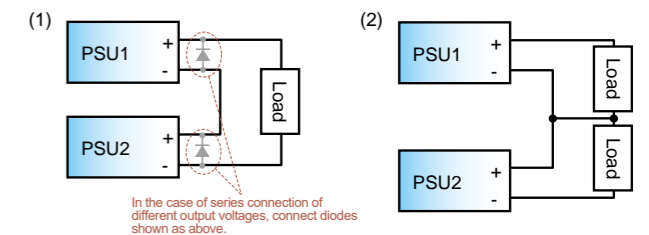
Connection in Series and Parallel

Series operation

Series connection is available as in figure (1) and (2) on the right. Series connection between different output voltages is available, such as 12 V and 24 V.

Note: In the case that different voltages are connected in series as in figure (1) on the right;

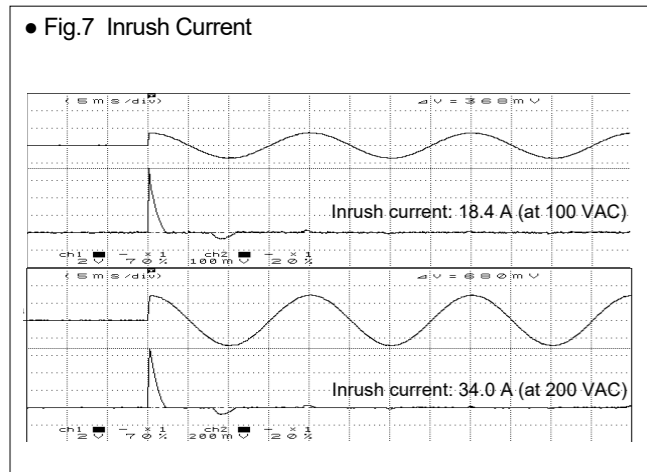
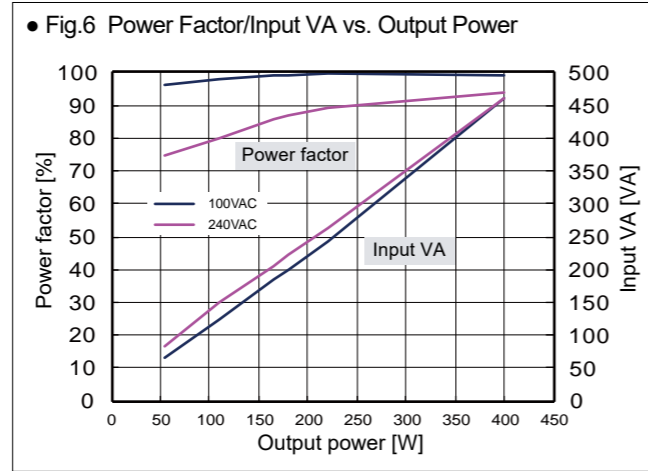
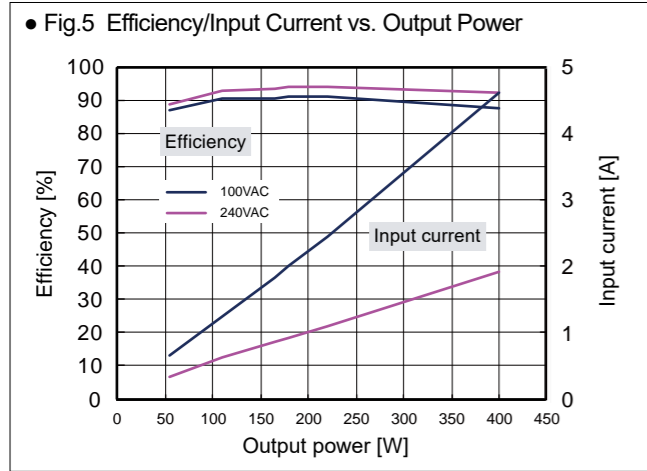
- The output current shall be the rated current or less of the smaller rated current among the PSU1 and PSU2 connected in series.
- Connect diodes for protection as show in the figure (1). The rated current of the diodes shall be 1.5 times or more of the peak output current of the power supply which has larger peak output current among PSU1 and PSU2. Also, use Schottky diodes whose forward voltage is lower than the forward voltage of the diodes used in the PSU.



Parallel operation

Parallel operation is unacceptable.

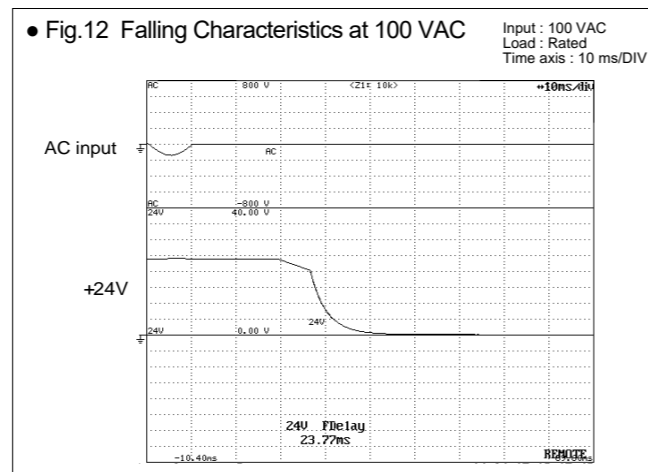
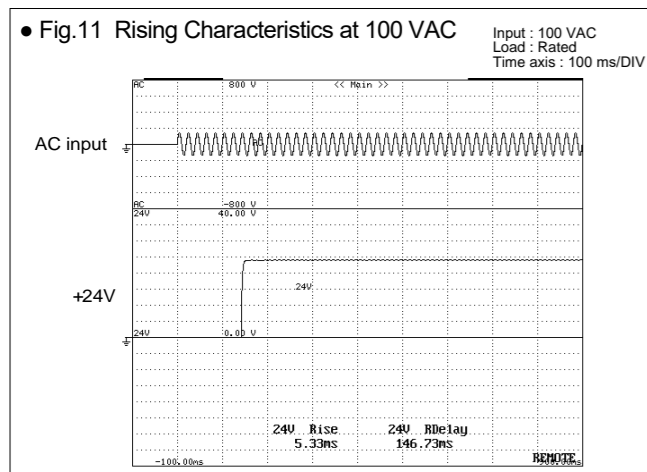
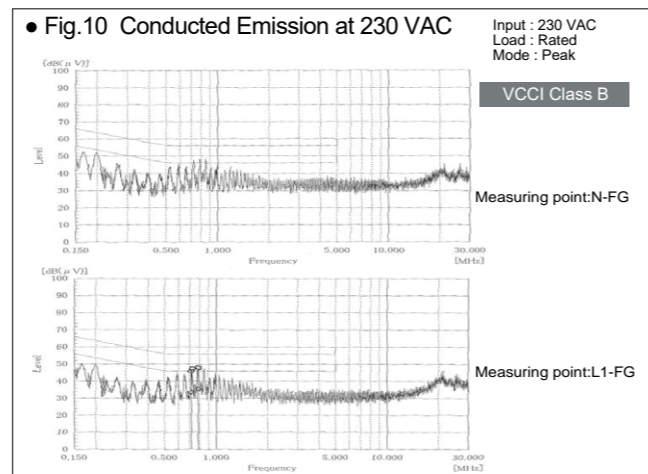
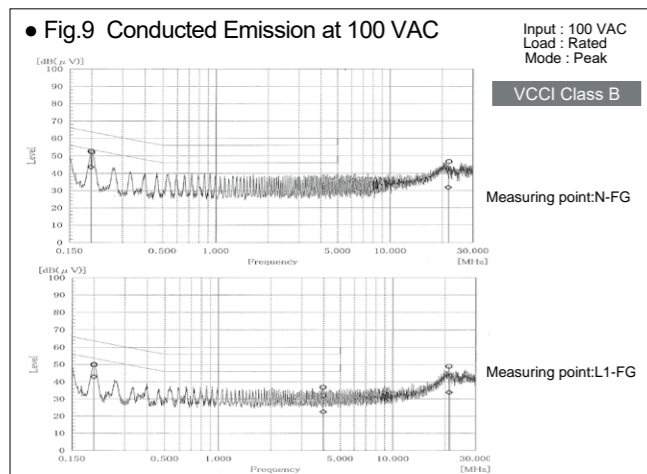
Characteristics Data (Typical features of the product series) **UZP-220-24** (Examples of actual measurement)



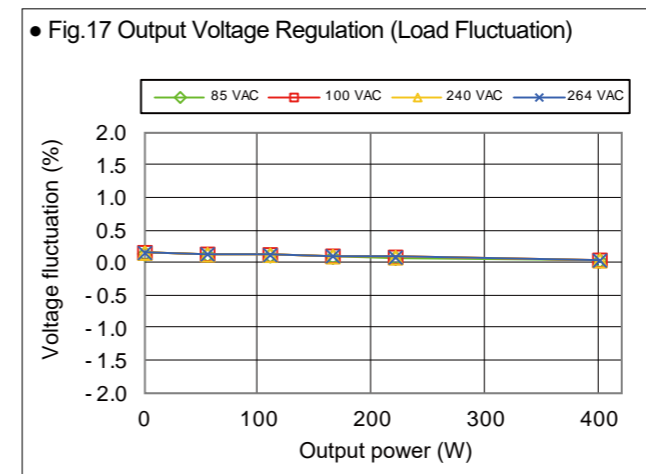
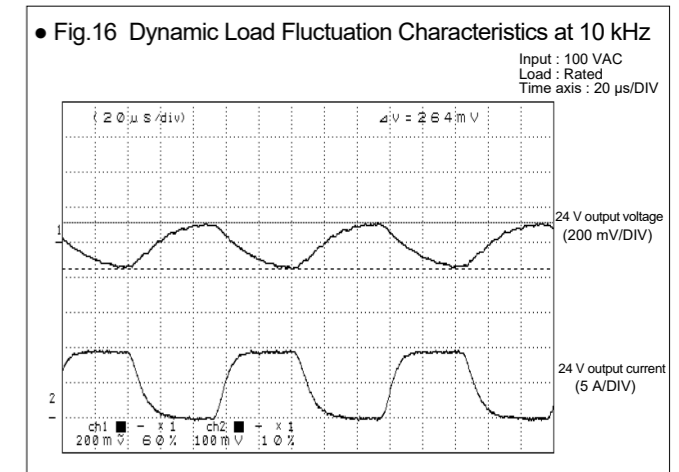
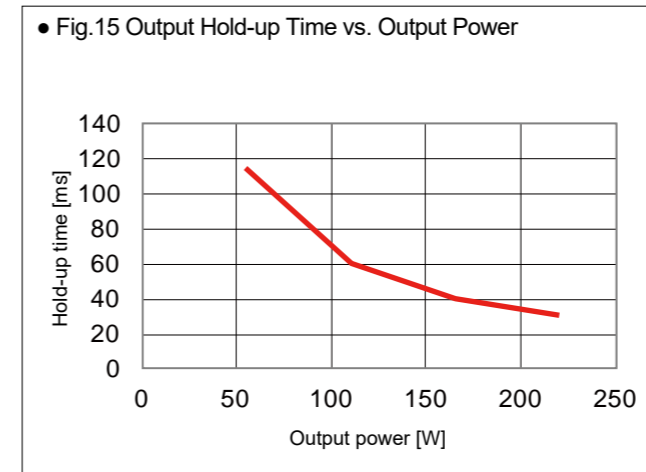
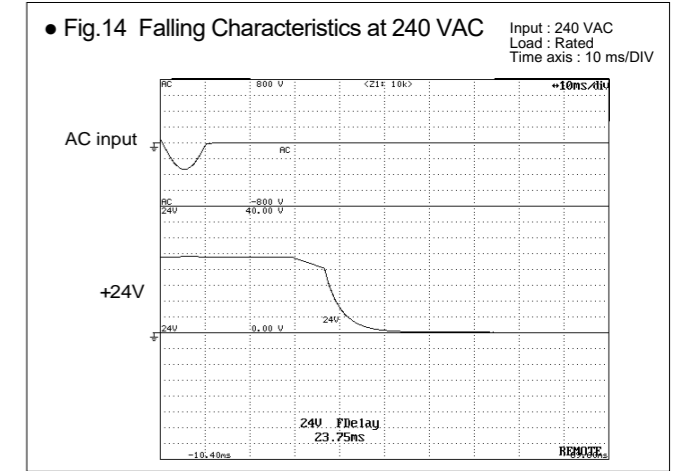
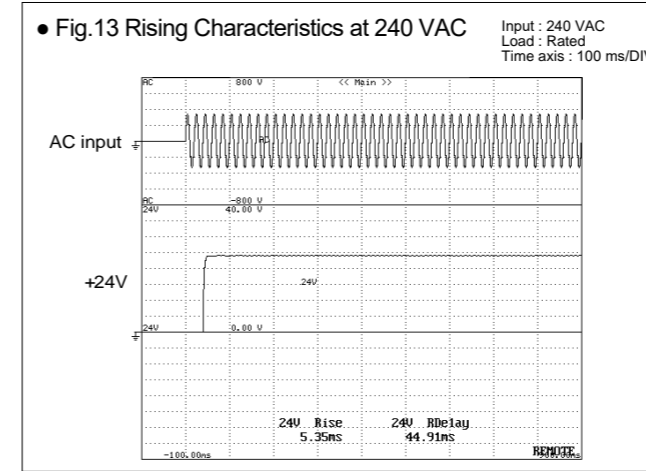
• Fig.8 Leakage Current

Input : 100, 200, 240 VAC
Load : Rated load and Min. load

	Rated load	Min. load
100 VAC	0.05 mA	0.06 mA
200 VAC	0.11 mA	0.12 mA
240 VAC	0.14 mA	0.14 mA



Characteristics Data (Typical features of the product series) **UZP-220-24** (Examples of actual measurement)



• Fig.18 Ripple and Spike Voltage

Spike voltage
Load : Rated

Temperature	Input voltage	24V
-15°C	100 VAC	40.4 mV
	240 VAC	31.7 mV
25°C	100 VAC	13.6 mV
	240 VAC	12.1 mV
55°C	100 VAC	9.5 mV
	240 VAC	9.2 mV
75°C	100 VAC	5.8 mV
	240 VAC	5.8 mV

Temperature	Input voltage	24V
-15°C	100 VAC	121.0 mV
	240 VAC	110.9 mV
25°C	100 VAC	99.8 mV
	240 VAC	95.3 mV
55°C	100 VAC	101.7 mV
	240 VAC	97.5 mV
75°C	100 VAC	66.2 mV
	240 VAC	64.5 mV

