

More realistic and flexible simulation,  
Introducing a New Bi-Polar power supply!



## Intelligent Bi-Polar Power Supply PBZ series

- 2 models available : PBZ20-20( $\pm 20V/\pm 20A$ ), PBZ40-10( $\pm 40V/\pm 10A$ )
- CV:100kHz, CC:10kHz(PBZ20-20), 5kHz(PBZ40-10)
- Interface USB, GPIB, and RS-232C are equipped as standard. LAN(Factory option)

**NEW**

For Bench Top use

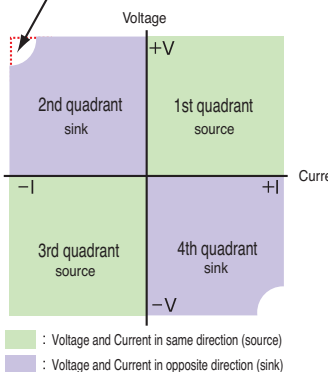
Weight  
Approx 22kg

40% Weight Reduction  
compared with PBX series

### Outline

The PBZ series is the bipolar type DC regulated power source that can continuously change both + and - polarities passing through 0 without changing the output terminal. While realizing drastic weight reduction by adopting the method of "Switching + Linear" system, it makes possible for the high speed operation with low noise. Since the operation covers 4 quadrants, the power can be supplied (source) and absorbed (sink), and also the inductive load or capacitive load can be driven. And it equips the signal generator function which enables to generate the waveform and setting the sequence. Furthermore, the synchronized operation which is required for the voltage variation of power source, and also for the expansion of large current application in master-slave parallel operation are possible.

Conceptual graph of Four quadrants (Bi-Polar) operation  
This area is operative in uni-polar mode



### Features

#### ■ Synchronized operation

In case of sequence operation using multiple units of the PBZ, it can synchronize the output of each power supply. The type of synchronization operations are trigger synchronization, clock synchronization, combined trigger and clock synchronization. (can be connecting up to 5 units)

#### ■ Master-slave parallel operation

The output current can be expanded in master-slave parallel operation connected with the same model up to 2 units using a standard option kit, also above 3 to 5 units can be configured upon request as custom designed.

#### ■ Waveform generator, Sequence functions

You can create the waveform very easily. There are Sine wave, Square wave, Triangle wave, and, 16 types of arbitrary waveform available, and you can simulate various patterns by the sequence setting of 1024 steps.

#### ■ Low ripple and noise (in CV mode)

Ripple : 2mVrms, Noise : 20mVp-p (PBZ20-20)

#### ■ Selectable Bi-polar/Uni-polar mode

The maximum sink power is limited at 100W for model PBZ20-20 (180W for model PBZ40-10) in the Bi-polar mode, however the Uni-polar mode has no limitation for the operating area and it can go up to the rated power of 400W.

#### ■ Others

- CV/CC selectable mode
- Memory function
- Protection functions (Over voltage/Over current/Over heat/ Power limit)
- Fine setting
- Key lock
- Remote sensing
- Output voltage/current monitor
- External voltage/resistance control
- External signal input
- Status signal output

### Applications

- For characteristic test of solenoids, coils...
- For testing DC motors...
- For testing superimposed ripple of automotive electronic equipment..
- For surface treatment or pulse plating of the electronic components..
- For testing leakage current or ground fault of the breaker..
- For simulating a secondary battery, fuel cell...
- For testing voltage variation of power source of automotive electronic equipment..

# Specifications (Tentative)

Input / Output		PBZ20-20	PBZ40-10
Input rating	Nominal Input Voltage	100V to 240Vac, 50/60Hz	
	Voltage and Frequency	90V to 250Vac, 47 to 63Hz	
	Input Current	10Amax	
	Inrush Current	Less than 40Apeak	
	Wattage	Less than 900VA	
	Power factor	0.95(TYP)	
Output rating	Output power	400W	
	Output voltage	±20V	±40V
	Output current	±20A	±10A
Output terminal	Output terminals	Rear panel output terminals (M4), sub output terminals	
	Isolation voltage	DC500V, Only the COM terminal is for the ground	
Constant Voltage (CV)			
DC voltage setting	Setting range	0V to ±(105% of rating)(BIPOlar) or 0V to +(105% of rating)(UNIPOlar)	
	Resolution (Fine)	0.001V (0.0001V)	
	Setting accuracy *1	±(0.05% of setting + 0.05% of rating)	
	Temperature coefficient	±(100ppm/°C of rating)(TYP)	
Superimposed AC current setting	Setting range	0Vp-p to (210% of rating)p-p	
	Resolution	0.1V	
	Setting accuracy *2	±(0.5% of rating)	
Constant voltage characteristics	Frequency Setting range	0.01Hz to 100.00kHz	
	Frequency response*3	DC to 100kHz(-3dB)(TYP)	
	Ripple / noise	2mVrms (10Hz to 1MHz)	4mVrms (10Hz to 1MHz)
Constant current (CC)	Load Effect *4	±(0.005% of setting + 1mV)	
	Line Effect *4	±(0.005% of setting + 1mV)	
	Response Time	3.5µs, 10µs, 35µs, 100µs (TYP)	
	Overshoot*5	less than 5% (TYP)	
	Setting range	0A to ±(105% of rating)	
DC current setting	Resolution (Fine)	0.001A(0.0001A)	
	Setting accuracy *1	±(0.3% of rating)	
	Temperature coefficient	±(100ppm/°C of rating)(TYP)	
	Setting range	0Ap-p to (10% of rating)p-p	
Superimposed AC current setting	Resolution	0.1A	
	Setting accuracy *6	±(0.5% of rating)	
	Frequency Setting range	0.01Hz to 100.00kHz	
Constant voltage characteristics	Frequency response*7	DC to 10kHz(-3dB)(TYP)	DC to 5kHz(-3dB)(TYP)
	Ripple noise	3mArms (10Hz to 1MHz)	
	Load Effect *8	±(0.01% of setting + 1mA)	
	Source Effect *9	±(0.01% of setting + 1mA)	
	Response Time	35µs, 100µs, 350µs, 1ms (TYP)	70µs, 100µs, 350µs, 1ms (TYP)
Overshoot*10	less than 5% (TYP)		

Measuring functions		PBZ20-20	PBZ40-10
Voltage measurement (DC)	Setting range	120% of rating	
	Resolution	0.001V	
	Setting accuracy *1	±(0.05% of reading + 0.05% of rating)	
	Temperature coefficient	±(100ppm/°C of rating)TYP.	
Voltage measurement (AC,DC+AC)	Measuring range	AC	120% of rating/CF*11
	Display resolution	0.001V	
	Accuracy *1,*12	5Hz<f< 10kHz	±(0.5% of reading + 0.1% of rating)
		10kHz<f< 50kHz	±(1% of reading + 0.2% of rating)
Voltage measurement (PEAK)	measuring range	120% of rating	
	Display resolution	0.01V	
	Accuracy *1,*13	±(0.5% of rating)	
Current measurement (DC)	measuring range	120% of rating	
	Display resolution	0.001A	
	Accuracy *1	±(0.3% of reading + 0.1% of rating)	
	Temperature coefficient	±(150ppm/°C of rating)TYP.	
Current measurement (AC,DC+AC)	Measuring range	AC	120% of rating/CF
	Display resolution	0.001A	
	Accuracy *1,*12	5Hz<f< 10kHz	±(3% of reading + 0.1% of rating)
		10kHz<f< 100kHz	±(10% of reading + 1% of rating)
Current measurement (PEAK)	measuring range	120% of rating	
	Display resolution	0.01A	
	Accuracy *1,*13	±(0.5% of rating)	
Common specifications	Measurement time (Aperture time)	100µs to 3600s	

Sequence functions	PBZ20-20	PBZ40-10
Number of programs/steps	16 programs/total 1024 steps	
Step time	100µs to 1000s (100µs step)	
Step setting descriptions	All output functions(except fine setting),Trigger input/output	

Others	PBZ20-20	PBZ40-10
Protection functions	±V limit or OVP, ±I limit or OCP, OHP, sink power limit	
Memory functions	Preset memory 3/ Setup memory 10	
Other functions	Synchronized operation (trigger synchronization, clock synchronization), Keylock, Mode select( BIPOlar/UNIPOlar, CV/CC), Remote sensing, Signal source setting, Beep sound, Parallel operation function, External signal input, Output voltage/current monitor, External voltage/resistance control	
Operating temperature/humidity	0 to +40°C / 20 to 85%RH	
Storage temperature/humidity	-25 to +70°C / less than 90%RH	
Dimensions (Max)	429.5Wx128(145)Hx550(595)D mm	
Weight	Approx. 22kg	

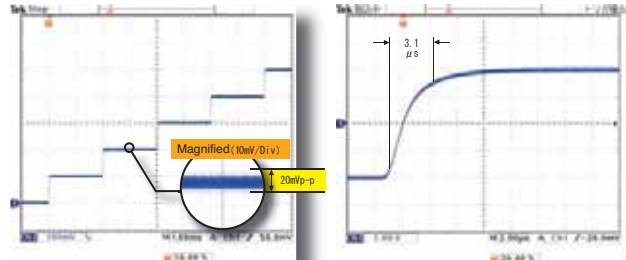
- \*1: In a 23°C±5°C environment
- \*2: 1kHz Sine wave, Response 3.5µs, at no load
- \*3: 1kHz Sine wave, Response 3.5µs, at rated load
- \*4: with the sensing terminal using remote sensing
- \*5: at no load or rated load
- \*6: 100Hz Sine wave, Response 35µs/70µs, at short circuit
- \*7: 100Hz Sine wave, Response 35µs/70µs, at rated load
- \*8: Fluctuation value of the output current to the load (10% to 100%) of the rated output voltage.
- \*9: Output voltage is at 10% to 100% of the rating
- \*10: with no load or rated load
- \*11: CF: Crest Factor (CF)
- \*12: Input applies less than 3 of Crest Factor within the range of 100kHz (measurement time is more than 10 times of the input interval)
- \*13: Calibrated with the crest value of 1kHz sine wave

Condition: The output COM terminal on the rear panel is connected to the chassis by the short piece which is included as a standard accessory.  
 Unless otherwise specified, the remote sensing is not used.  
 The warm-up time is 30 minutes (with current flowing).  
 The load is pure resistance  
 The "TYP" value is not guaranteed of the specifications in the typical value at 23°C environment

## ■ Rear Panel



## ■ High-quality waveform will not affect to the test waveform



▲ 0.1V step actual waveform sample  
 Ripple: 2mVrms, Noise: 20mVp-p (PBZ20-20)

▲ Rise-up waveform sample  
 When the response is set to 3.5µs (PBZ20-20)

## ■ Expansion for large current application

The output current can be expanded in master-slave parallel operation connected with the same model up to 2 units using a standard option kit, also above 3 to 5 units can be cabled upon request as custom designed.



Sample of the custom designed system for the master-slave parallel operation.

## ■ Options

- Parallel operation kit (for 2 units)
- Rack-mount bracket
- Vertical Stand
- LAN Interface (available soon)



PBZ unit using a vertical stand

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