5200A
AC Source
Operation Manual

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P/N:90052001 REV:A

Preface

We appreciate your purchasing this product, 5200A.
For your extensive operations and longer and secure usage, please review this manual before start using this product.

When you unpack. (Pls check the items in the package)

In the package of this product , the following product and its attachments should be included..
Please make sure if all of them are surely included.

1) This product : 5200A main body
2) AC Power cable * 1pc
3) Operation manual (This document)
4) Software CD *1pc

Operation manual in PDF file

In the attached CD, there is an operation manual in PDF format. To open and read this manual. You need to install the “Acrobat Reader” of Adobe systems.
You can download from the Adobe system’s site at http://www.adobe.co.jp/.

Support

Regarding any questions of this product, you can contact us as described below.

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Warranty

We warrant the following regarding this product.

1) Availability for one year from the date of shipment
2) Accuracy in the specifications for half year after date of shipping.
   We can provide warranty service in case any of above can not achieved.
   But in case of any of the following, we can provide our service for a fee.

1) Usage beyond a specification range.
2) Usage prohibited in this manual
3) High impact due to drop.
4) The cover of this product was opened without our prior permission in writing or any equivalent behavior was detected by us.
5) Any modification or any equivalent behavior relating to the specifications or performance of this product is done or detected by us
6) Any convulsion of nature such as fire and earthquake and act of war or a kind of terrorism, or.
7) Any other reason that is not due to our manufacturing.

We also warrant that the software stored in attached medium can be read for 90 days from the date of shipment in your normal operation. We will provide the alternative medium in case unreadable for free of charge with this period. But expired, the charge will be applied. We retain rights to update the contents of our documents including this operation manual any time without any notice, and even in such a case, any of the updated documents won’t be sent automatically to send to a customer unless we decide otherwise.

Warning

Not decided yet.

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Chapter 1
Introduction

1.1 Outline

This product, 5200A, is a AC/DC power supply unit. Implemented our unique patented technology called combined type circuit method, this product has advantages of both higher waveform quality of linear amp type AC sources and smaller size of inverter type AC sources as well.
This products has higher waveform quality and higher efficiency as well.

1.2 Features

Higher waveform quality

This product, as described above, has very unique features having both higher waveform quality and higher efficiency as well. More specifically, for example, an AC source based on the inverter type has 0.5% or more waveform distortion ration, but this product has only 0.1% or less warranted by its specifications. (AC50/60Hz)

Regarding the ripple on the DC output, only a few level can be found in this product comparing with an inverter type AC sources.

Higher efficiency

Generally, a linear type AC source, comparing to a inverter type AC source, has better waveform quality but heavier and lower efficiency (ratio between output and input). This product has almost the same values as the inverter type AC source has ,having 60% or more efficiency as the specification.(when rated output).

Accurate measurement functions

Conventionally, the measuring functions of a AC source is not very accurate as measuring instrument because the purpose of the measurement was to check the operation of AC source itself. But this product has the measurement capability equivalent to measurement instrument, allowing you to reduce the cost otherwise necessary to secure such measurement instrument.

Affordable price

We can provide this product having advantages above in not exceeding the prices of expensive price comparing with other prevailing models.

1.3 Specifications

Both AC/DC outputs

You can select AC/DC output.

Peak curr. up to four times higher than the rated current of thereof

Current up to four times higher than rms value can flow. (in case of condenser input type load)

0.1Hz step frequency resolution

1 deg. resolution of start phase angle

Emulation of power Interrupt and DIP-POP waveform

This is a standard function of this product , not an option.

Wide range of input volt. (90～260V)

For world-side various power voltages.

High power factor improvement circuit (0.95 or more) is implemented in the input section

Setting saving function

You can save and recall settings various conditions including volt. and frequency.

PC control via USB I/F

Driver and library software for the USB I/F of this product are attached. With this library (Active X component), you can control this product and measure from the Microsoft Excel software.

Input line sync. output function

Measuring input line frequency, and set the output frequency same as the input line. Note: There is no setting the same phase angle of the output as the input.

Output trigger signal

TTL level signal is outputted according to the timing of ON/OFF. You can use this for a measurement such as requiring the timing of rising or falling of the input as the trigger signal.

Various options

- GPIB interface

  Commands conforming to the SCPI are supported. This allows you to use this product in your current system more easily.

- Ethernet interface

  You can connect this product to an network and control this product via the network, allowing you to control this product and measure data by this product that is located much far from the controller than using the USB or GPIB alone. This would be especially beneficial when you need to control from the place far from this product because of some reasons including safety and location plan. The Ethernet interface of this product is electrically isolated, this could reduce the possibility of noise wrap-around. And when you use the Ethernet, you can use a function to send an e-mail in the event that an error occurs.

- Output impedance control function

  You can change the output impedance, allowing you use this product as an expensive impedance network.

- Arbitrary waveform output function

  You can create an arbitrary waveform while viewing on a monitor of your PC. The created waveform will be downloaded to this product via USB or the Ethernet to output the same waveform you created on the PC.

  And the downloaded data can be stored in this product so that you can recall use it

Protection functions

Description will be added later.

1.4 Cautions when you use this product

Do not touch the load terminals of this product

High volt. may be presented on these terminals. During the operation, please do not touch the load terminal with your bare hand any time. When you install wiring you disconnect the input line of this product first so that no power is supplied to this product.

Be careful for correct wiring

Do not reversely connect Input and Output. The reversed connection would cause the trouble of this product.

There are input and output terminals nearby on rear side of this product. Both terminals may look like the same figures, so please pay as much attention as you could when you wire input / output wiring.

Installation site

This product needs to be installed where there are no high humidity, high temperature, much dusts, direct sunlight, combustible or corrosive gas, and vibrations due to machines etc.

Install position

Never fail to put the bottom of this product on a horizontal plane. Putting this product upside down or tilted might cause a trouble of this product.

Do not put any heavy subject on the top of this product.

Especially, putting anything pressing its weight to the center of the top of this product would cause a trouble of this product.

Do not block ventilation of this product

Do not put anything in front of or in rear of this product that could block the ventilation of this product.

When you install this product in a rack, please ventilate inside the rack while this product is powered ON.

Cautions about Noise

Do not put any device susceptible to noise nearby this product.

Continuous operation.

Description will be added later.

When you think that this product has a trouble.

Please power OFF this product immediately and detach all the input wiring to avoid further trouble such as fire.

Chapter 2
Specifications

2.1 General

Sizes	430(W)x221(H)x600(T) (excluding legs)
Weight	Approx.35Kg
Operating temp./humid.	10°C～40°C/10%～90%RH(Non condensing)
Withstand volt. *1	AC1KV 50Hz , 1min.
Insulation resistance *1	10MΩor more

*1 : When a varistor type surge absorber is not installed inside this product

2.2 Output section

ACMode

		LOW range	HIGH range
Max output power *1		2KVA	
No of phases		Single phase	
Output volt. range		0V～150Vrms	0V～300Vrms
Output volt. setting resolution		0.1Vrms	
Output volt. setting accuracy *2		±0.2% of setting + 0.2% of F.S	
Max. output curr. *2		20Arms	10Arms
Max peak curr. *2		80Apeak	40Apeak
Load regulation		40～70Hz:±0.2%以内/70～500Hz:±0.5% or less	
Input volt. regulation		±0.3% or less	
Ambient temperature change		±100ppm/°C or less	
Distortion ratio (Resistor load mode) *2		0.1% or less(typ)	
Frequency	Setting range	40Hz～500Hz	
	Setting range	±0.5Hz	
	Setting range	0.1Hz	
Power ON phase angle		0 ° ～360 ° (resolution:1 ° when 50/60Hz)	
Output impedance	Setting range (R)	10mΩ～1Ω	
	Setting range (L)	10μH～100μH/0.1mH～1mH	
	Setting resolution	±1%(typ)	
	Accuracy of setting(R)*2	±5% of setting + 5% of F.S	
	Accuracy of setting(L)*2	±10% of setting + 10% of F.S	
Line sync. output		AC synchronized with Line freq. Is outputted *3	

*1 When input is 100V system, Max. output power is 800VA(AC mode).
*2 When the output freq. is 50/60Hz.
*3 Phase is NOT synchronized.

DC mode

		LOW range	HIGH range
Max. output power *4		1KW	
Ouput volt. range		0V～200V	0V～400V
Ourput volt . setting resolution		0.1V	0.5V
Ouptut volt. setting accuracy		±0.2% of setting + 0.2% of F.S	
Max. output curr.		10A	5A

2.3 Meas. section

		LOW range	MID range	HIGH range
AC volt.	range	300Vrms		
	accuracy	±0.3% of rdg + ±0.2% of F.S		
	resolution	0.1Vrms		
AC curr.	Range	0.2A	2A	20A
	Acc. *2,6	±0.2% of rdg + ±0.5% of F.S	±0.2% of rdg + ±0.2% of F.S	±0.2% of rdg + ±0.2% of F.S
	Acc. *2,6	±0.5% of rdg + ±0.5% of F.S	±0.5% of rdg + ±0.2% of F.S	±0.5% of rdg + ±0.2% of F.S
	resolution	0.1mA	1mA	10mA
Effective power	Range	20W	200W	2000W
	Acc. *2,6	±0.3% of rdg + ±0.5% of F.S	±0.3% of rdg + ±0.3% of F.S	±0.3% of rdg + ±0.3% of F.S
	Acc. *2,7	±0.7% of rdg + ±0.5% of F.S	±0.5% of rdg + ±0.3% of F.S	±0.5% of rdg + ±0.3% of F.S
	resolution	0.01W	0.1W	1W
Apparent power		Calculated by measured data of volt. curr. and power.		
Reactive power				
P.F.				
Peak curr.	Range	100A		
	Acc. *2,7	±0.3% of rdg + ±0.2% of F.S		
	resolution	0.1A		

*2 When 50/60Hz.
*6 When in resistor load mode(crest factor is 1.41)
*7 When full-wave rectifier with the crest factor less then 3.

2.4 Input section

Input volt range	90Vrms～260Vrms*1
Max. input curr.	15Arms(MAX)
Freq. range	45Hz～65Hz
Power factor	0.95or more
Efficiency *8	60%以上(typ)

*1 When input is 100V system, Max. output power is 800VA(AC mode).
*8 when rated load condition.

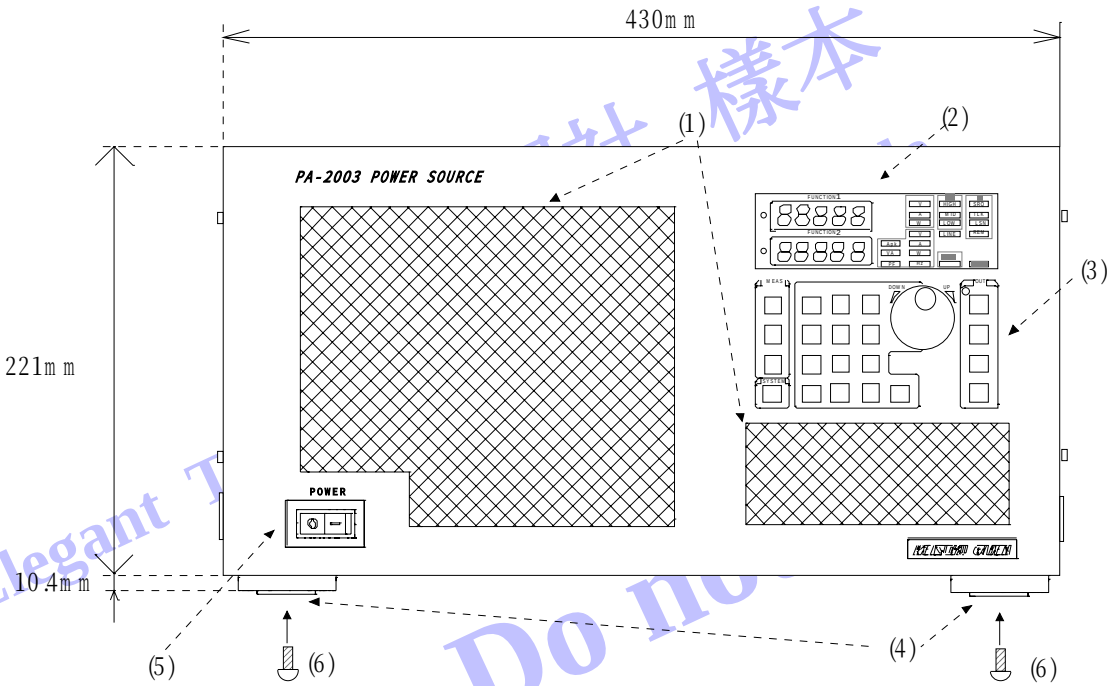
2.5 I/F

USB	Conforms to the USB1.1
GPIB (option) *9	IEEE488.1/IEEE488.2(SCPI)
Ethernet (option) *9	10BASE-T
Ext. trig. Output	Ouputted when ON/OFF (pulse width 50μs)

*9 Factory Option

Chapter 3
Description of each section

3.1Front panel



(1) Air inlet
This is the input of ventilation to cool the inside.
Do not put anything to block the ventilation.

(2) Display
Upper and lower 5 digits 7segment display showing various status.

(3) Operation panel
Consisting of function keys , rotary knob to select and changing values and ten keys . For detailed operations, refer to relevant pages in this manual. (*********)

(4) Leg
Please do not remove the legs from this product unless this product is installed in rack. When installed in a rack, this legs needs to be removed. To remove the leg, remove the screws fixing the leg.

(5) Power switch
This is a power switch of the 5200A. Press right-side portion to power ON.

(6) screw to fix the leg
When you remove the legs of this product, remove this screw.

Display

7segment display unit
various items of measured values, setting values, status code No. when an alarm occurs , and etc. can be displayed.
There are busy lamps on both upper and lower sections, lighting while measurement is done.

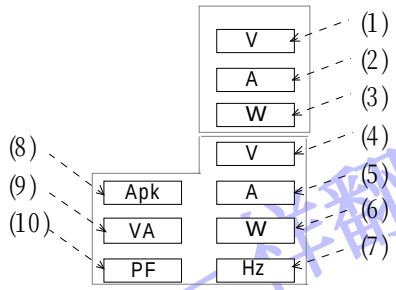
LINE sync. lamp
Lighting this lamp represents the setting of the LINE sync. mode where the frequency of the AC output from this product is automatically set the same as that of the AC input to this product. When this lamp is OFF, the output frequency becomes the same frequency you setup.
* Phase will not be synchronized.

300V lamp

When this lamp is ON, HIGH range (300V range) is selected, and this lamp is OFF, LOW range (150V range) is selected.

Unit lamps

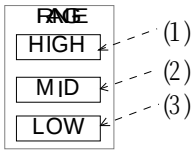
Unit lamps located on the right side of the 7segments show units for measurement and setting. There are three (3) kinds of units for upper display and seven (7) kinds of units for lower display. Each group is surrounded by a frame line.



Each lamp No. represents as follows
Upper group
(1)Volt. (2)Curr. (3)Effective power
Lower group
(4)Volt. (5)Curr.(6) Effective power (7) Frequency (8) Peak curr. (9)Apparent power (10) Power factor

Meas. range lamps

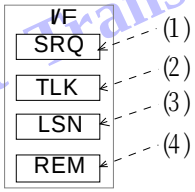
Curr. meas. range presently selected is turned ON. When in AUTO range, presently selected range is turned ON.



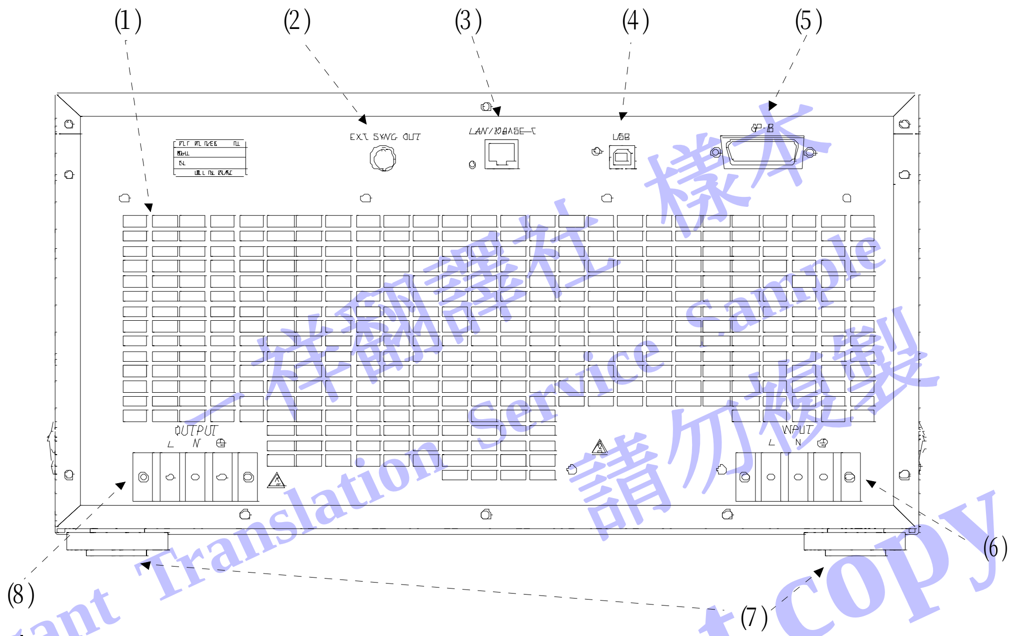
(1) HIGH range 20A range
(2) MID range 2A range
(3) LOW range 0.2A range

I/F lamps

These lamps show the status of the I/F for remote control. The REM lamp is turned ON when this product receives a remote command regardless of I/F types. When the REM lamp is ON, this product won't any key operation except a key to change from the remote mode to local mode. SRQ,TLK, and LSN lamps are turned ON only when you use the GPIB I/F. Refer to GPIB chapter for detailed.



3.2 Rear panel



(1) Air outlet

Air taken into from the front of this product is exhausted from this outlet. Please do not put anything in front of this output because it could block air flow from this outlet. And please don not put this product where this product is surrounded by anything that would block the air flow.

(2) Trigger output BNC connector

Pulse signal synchronized with the ON/OFF timing of the output can be outputted. Since the level is equivalent to the TTL level, you can use this signal as the trigger for various instrument such as an oscilloscope.

(3) Ethernet connector (option)

This I/F conforms to the 10BASE-T standard. This product supports TCP/IP as the protocol, allowing you to control via general socket data transmission. And there is a function that, when an error occurs, an e-mail is automatically sent to the address you previously designated.

(4) USB connector

This is a connector by which you can hook up this product to your PC. Conforming to the USB1.1 standard, this USB allows you to control this product from you PC by using the device driver and control library attached to this product. Refer to USB I/F for detailed.

(5) GPIB connector（option）

This is the I/F conforming to the IEEE488.1. You can control this product from a general GPIB controller etc. Refer to GPIB I/F for detailed information.

(6) Input terminal block

This is power input of this product. This input terminal block is located right side of this rear panel. The terminal block located on the left side of this real panel is for the output of this product. Please do not mistake these two input and output. For the connections , refer to Chapter 3 connections.

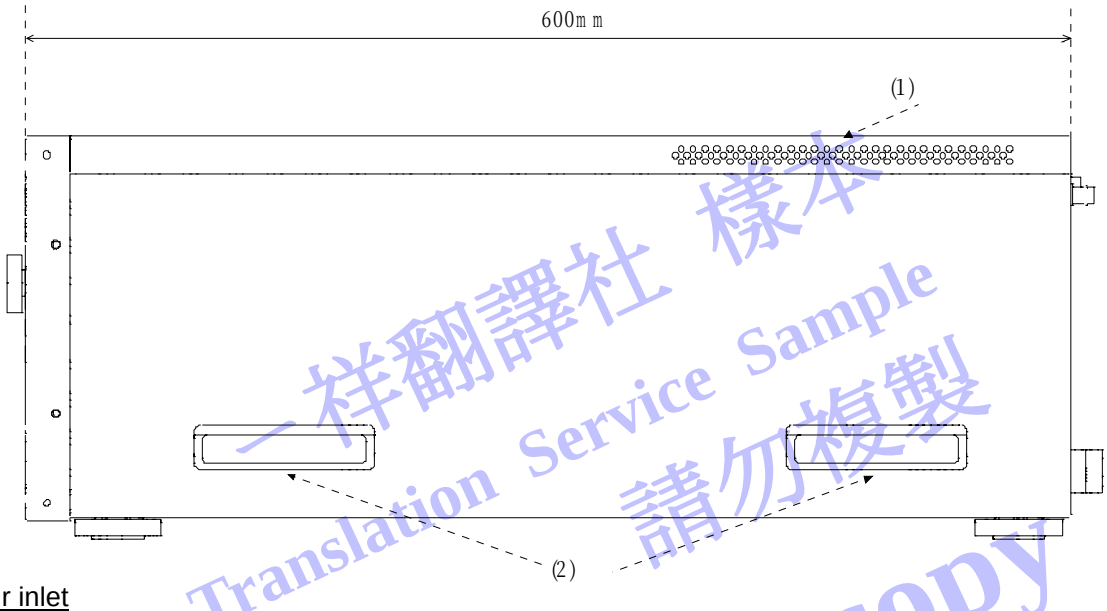
(7) leg

Please put always these legs unless you put this product into a rack. When you put his product into a rack , it is necessary to remove these legs. To remove it , remove screw fixed the leg to this product

(8) Output terminal block

This is the output from this product. Again , please do not connect wirings by mistaking this output for the input to this product and vice versa.

3.3 Side panel



(1) Air inlet

This inlet is for taking air into this product.
Do not put anything that could block the air flow.

(2) Handles

These handles are for your carrying this product. Please use these handles so as not to shut in your hands when you carry this product.

3.4 Direction in installation

This product is designed that the bottom face of this product to keep horizontally. In any case, please do NOT put the front or rear panel on the bottom, because such installation would damage this product and cause a trouble of this product.

When you remove the legs of this product, put this product over sideways on soft material like close. Putting directly on hard material like concrete would cause a damage like a dent to the product.