ASR-2000 Series

Compact Programmable AC/DC Power Supply

FEATURES

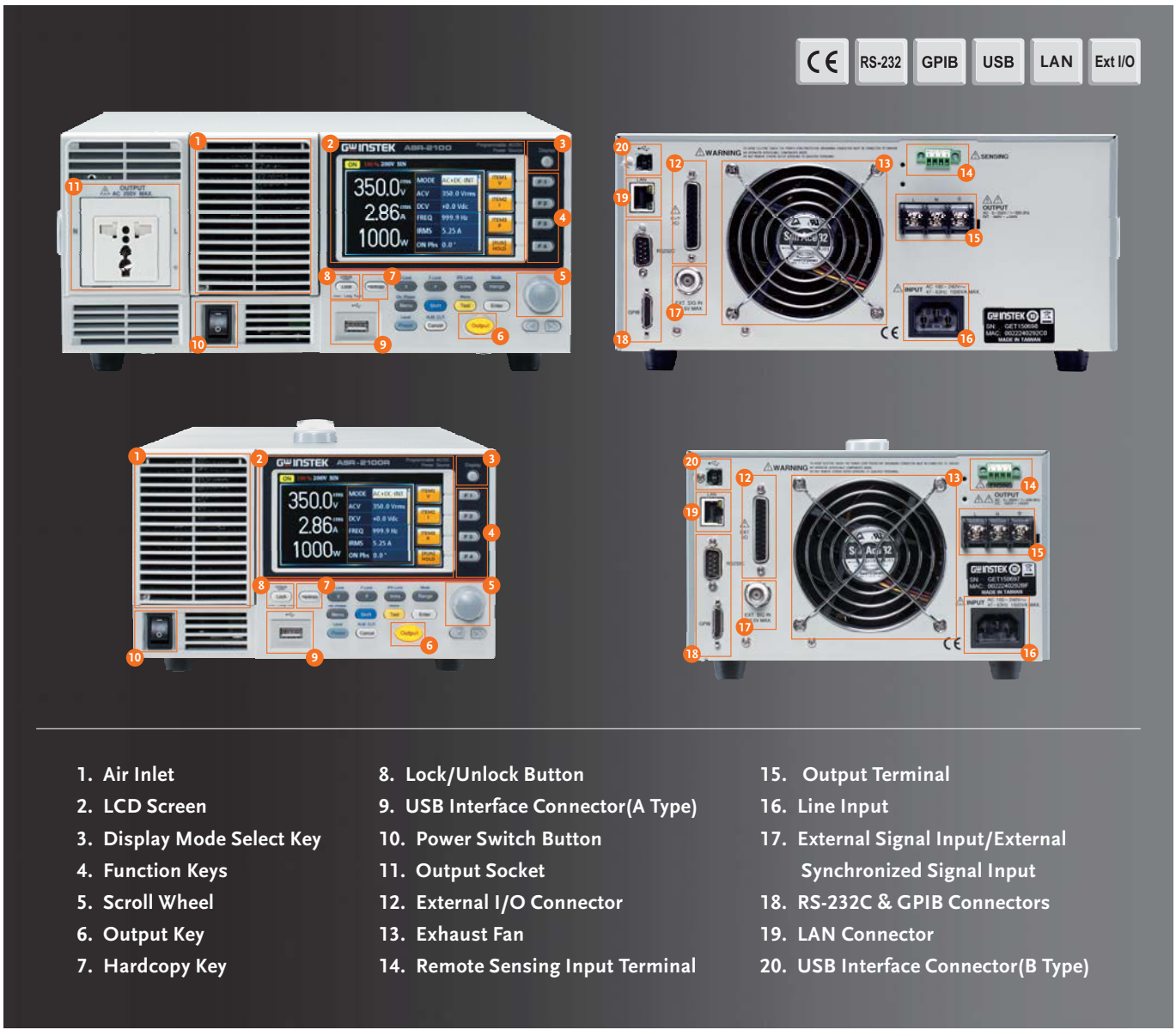
- Output Rating: AC 0 ~ 350 Vrms, DC 0 ~ ±500 V
- Output Frequency up to 999.9 Hz
- DC Output (100% of Rated Power)
- Output Capacity: 500VA/1000VA
- Measurement Items: Vrms, Vavg, Vpeak, Irms, IpkH, Iavg, Ipeak, P, S, Q, PF, CF
- Voltage and Current Harmonic Analysis (THDv, THDi)
- Customized Phase Angle for Output On/Off
- Remote Sensing Capability
- OVP, OCP, OPP, OTP, AC Fail Detection and Fan Fail Alarm
- Interface: USB, LAN (std.); RS-232+GPIB (opt)
- Built-in External Control I/O and External Signal Input
- Built-in Output Relay Control and Memory Function (up to 10 sets)
- Sequence and Simulation Function (up to 10 sets)
- Support Arbitrary Waveform Function and Built-in Web Server

The ASR-2000 series, an AC+DC power source aiming for system integration or desktop applications, provides both rated power output for AC output and rated power output for DC output. Ten ASR-2000 output modes are available, including 1) AC power output mode (AC-INT Mode), 2) DC power output mode (DC-INT Mode), 3) AC/DC power output mode (AC+DC-INT Mode), 4) External AC signal source mode (AC-EXT Mode), 5) External AC/DC signal source mode (AC+DC-EXT Mode), 6) External AC signal superimposition mode (AC-ADD Mode), 7) External AC/DC signal superimposition mode (AC+DC-ADD Mode), 8) External AC signal synchronization mode (AC-SYNC Mode), 9) External AC/DC signal synchronization mode (AC+DC-SYNC Mode), 10) External DC voltage control of AC output mode(AC-VCA).

The ASR-2000 series provides users with waveform output capabilities to meet the test requirements of different electronic component development, automotive electrical devices and home appliance, including 1) Sequence mode generates waveform fallings, surges, sags, changes and other abnormal power line conditions; 2) Arbitrary waveform function allows users to store/upload user-defined waveforms; and 3) Simulate mode simulates power outage, voltage rise, voltage fall, and frequency variations. When the ASR-2000 series power source outputs, it can also measure Vrms, Vavg, Vpeak, Irms, Iavg, Ipeak, IpkH, P, S, Q, PF, CF, 100th-order Voltage Harmonic and Current Harmonic. In addition, the Remote sense function ensures accurate voltage output. The Customized Phase Angle for Output On/Off function can set the starting angle and ending angle of the voltage output according to the test requirements. V-Limit, Ipeak-Limit, F-Limit, OVP, OCP, OPP function settings can protect the DUT during the measurement process. In addition to OTP, OCP, and OPP protection, the ASR-2000 series also incorporates the Fan fail alarm function and AC fail alarm function.

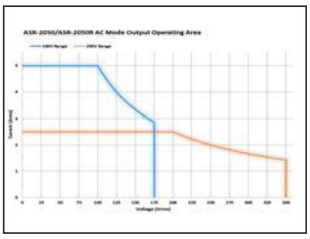
The front panel of the ASR-2050/2100 provides a universal socket or a European socket, which allows users to plug and use so as to save wiring time. The ASR-2050R/2100R is 3U height and 1/2 Rack width design, which is compatible with ATS assembly. The ASR-2000 series supports I/O interface and is equipped with USB, LAN, External I/O and optional RS-232C and GPIB.

PANEL INTRODUCTION

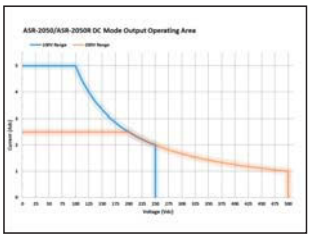


1. Air Inlet
2. LCD Screen
3. Display Mode Select Key
4. Function Keys
5. Scroll Wheel
6. Output Key
7. Hardcopy Key
8. Lock/Unlock Button
9. USB Interface Connector(A Type)
10. Power Switch Button
11. Output Socket
12. External I/O Connector
13. Exhaust Fan
14. Remote Sensing Input Terminal
15. Output Terminal
16. Line Input
17. External Signal Input/External Synchronized Signal Input
18. RS-232C & GPIB Connectors
19. LAN Connector
20. USB Interface Connector(B Type)

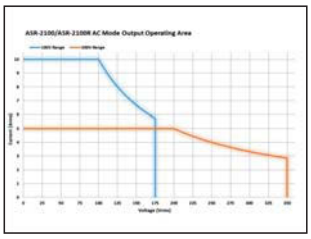
A. OPERATING AREA FOR ASR-2000 SERIES



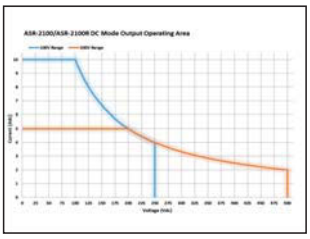
AC Output for ASR-2050/ASR-2050R



DC Output for ASR-2050/ASR-2050R



AC Output for ASR-2100/ASR-2100R



DC Output for ASR-2100/ASR-2100R

The ASR-2000 series is an AC+DC power source that provides rated power output not only at the AC output, but also at the DC output. The operation areas are shown in diagrams.

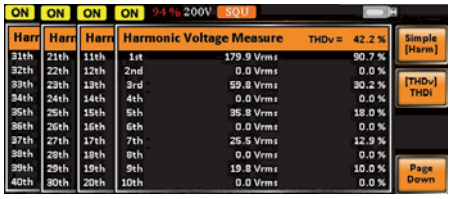
Model Name	Power Rating	Max. Output Current	Max. Output Voltage
ASR-2050	500 VA	5 / 2.5 A	350 Vrms / 500 Vdc
ASR-2100	1000 VA	10 / 5 A	350 Vrms / 500 Vdc
ASR-2050R	500 VA	5 / 2.5 A	350 Vrms / 500 Vdc
ASR-2100R	1000 VA	10 / 5 A	350 Vrms / 500 Vdc

B. MEASUREMENT ITEMS FOR ASR-2000 SERIES

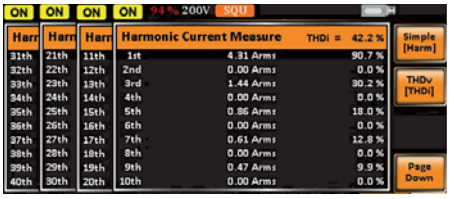
RMS Meas Display

AVG Meas Display

Peak Meas Display



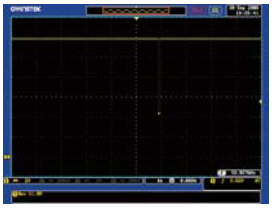
Voltage Harmonic



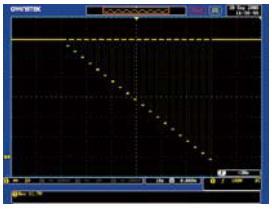
Current Harmonic

The ASR-2000 series provides users with measurement capabilities including Vrms, Vavg, Vpeak, Irms, Iavg, Ipeak, IpkH, P, S, Q, PF, CF, 100th-order Voltage Harmonic and Current Harmonic. During the power output, the measurement parameters including Vrms/Irms, Vavg/Iavg and Vmax/Vmin/Imax/Imin can be switched by users at any time to display the instantaneous calculation reading.

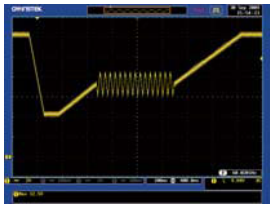
C. SEQUENCE MODE AND APPLICATIONS



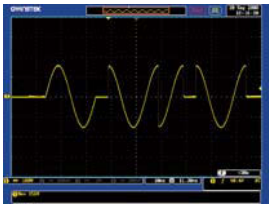
Momentary Drop in Supply Voltage



Reset Behavior at Voltage Drop



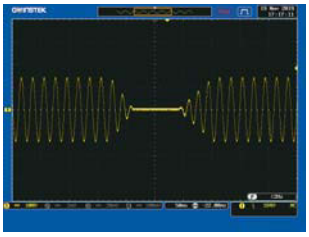
Starting Profile Waveform



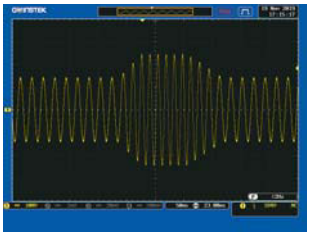
Instantaneous Power Failure

There are 10 sets of Sequence mode and each set has 0~999 steps. The time setting range of each step is 0.0001 ~ 999.9999 seconds. Users can combine multiple sets of steps to generate the desired waveforms, including waveform fallings, surges, sags, changes and other abnormal power line conditions to meet the needs of the test application.

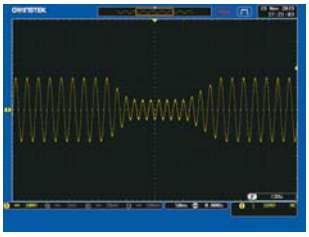
D. SIMULATE MODE



Power Outage



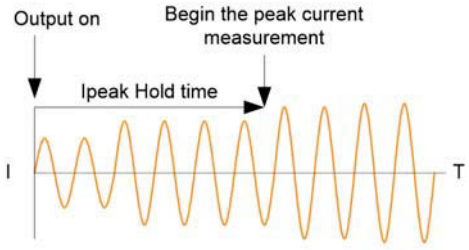
Voltage Rise



Voltage Fall

Simulate Mode can quickly simulate different transient waveforms, such as power outage, voltage rise, voltage fall, etc., for engineers to evaluate the impact of transient phenomena on the DUT. Ex: Capacitance durability test.

E. T, IPK HOLD & IPK, HOLD FUNCTIONS

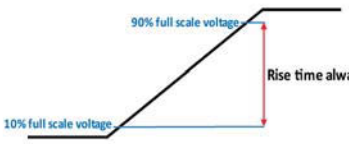


T, Ipk Measurement

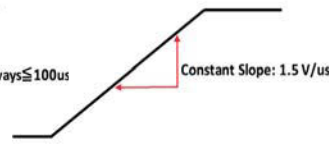
T, Ipk Hold is used to set the delay time after the output (1ms ~ 60,000ms) to capture the Ipeak value and keep the maximum value. The update only functions when the measurement value is greater than the original value. The T, Ipk Hold delay time setting can be used to measure surge current at the power on process of the DUT.

Ipk Hold can be used to measure the transient surge current of the DUT at power on without using an oscilloscope and a current probe.

F. SLEW RATE MODE



Time Mode

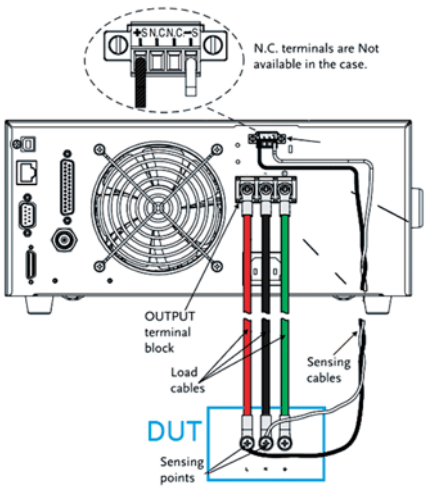


Slope Mode

The ASR-2000 series can set the Slew Rate Mode to determine the rise time of the voltage according to the test requirements of the DUT. Slew Rate Mode provides "Time" and "Slope" modes. When setting "Time" mode, ASR-2000 can increase output to 10~90% of the set voltage within 100μs; and when selecting "Slope" mode, ASR-2000 increases output voltage by a fixed rising slope of 1.5V/μs until reaching the set voltage value.

In addition, if users decide to self-define the rise time of the output voltage, users can flexibly set the rise time of the ASR-2000 series voltage by editing the Sequence mode.

G. REMOTE SENSE FUNCTION



For high current output applications, the voltage drop caused by large current passing through the load cables will affect the measurement results. The ASR-2000 series provides the remote sense function that can sense the voltage drop of the DUT to the ASR-2000 series and the DUT will be compensated by the ASR-2000 series. The maximum voltage that the remote sense function can compensate is 5% of the output voltage.

SPECIFICATIONS

		ASR-2050/ASR-2050R	ASR-2100/ASR-2100R
INPUT RATING (AC)			
NORMINAL INPUT VOLTAGE		100 Vac to 240 Vac	100 Vac to 240 Vac
INPUT VOLTAGE RANGE		90 Vac to 264 Vac	90 Vac to 264 Vac
PHASE		Single phase, Two-wire	Single phase, Two-wire
INPUT FREQUENCY RANGE		47 Hz to 63 Hz	47 Hz to 63 Hz
MAX. POWER CONSUMPTION		800 VA or less	1500 VA or less
POWER FACTOR*1	100Vac	0.95 (typ.)	0.95 (typ.)
	200Vac	0.90 (typ.)	0.90 (typ.)
MAX. INPUT CURRENT	100Vac	8 A	15 A
	200Vac	4 A	7.5 A
*1. For an output voltage of 100 V/200 V (100V/200V range), maximum current, and a load power factor of 1.			
AC MODE OUTPUT RATINGS (AC rms)			
VOLTAGE	Setting Range*1	0.0 V to 175.0 V / 0.0 V to 350.0 V	
	Setting Resolution	0.1 V	
	Accuracy*2	±(0.5 % of set + 0.6 V / 1.2 V)	
OUTPUT PHASE		Single phase, Two-wire	
MAXIMUM CURRENT*3	100 V	5 A	10 A
	200 V	2.5 A	5 A
MAXIMUM PEAK CURRENT*4	100 V	20 A	40 A
	200 V	10 A	20 A
POWER CAPACITY		500 VA	1000 VA
FREQUENCY	Setting Range	AC Mode: 40.00 Hz to 999.9 Hz, AC+DC Mode: 1.00 Hz to 999.9 Hz	
	Setting Resolution	0.01 Hz (1.00 to 99.99 Hz), 0.1 Hz (100.0 to 999.9 Hz)	
	Accuracy	For 45 Hz to 65 Hz: 0.01% of set, For 40 Hz to 999.9 Hz: 0.02% of set	
	Stability*5	± 0.005%	
OUTPUT ON PHASE		0.0° to 359.9° variable (setting resolution 0.1°)	
DC OFFSET*6		Within ± 20 mV (TYP)	
*1. 100 V / 200 V range *2. For an output voltage of 17.5 V to 175 V / 35 V to 350 V, sine wave, an output frequency of 45 Hz to 65 Hz, no load, DC voltage setting 0V (AC+DC mode) and 23°C ± 5°C *3. For an output voltage of 1 V to 100 V / 2 V to 200 V, Limited by the power capacity when the output voltage is 100 V to 175 V / 200 V to 350 V. *4. With respect to the capacitor-input rectifying load. Limited by the maximum current. *5. For 45 Hz to 65 Hz, the rated output voltage, no load and the resistance load for the maximum current, and the operating temperature. *6. In the case of the AC mode and output voltage setting to 0 V.			
OUTPUT RATING FOR DC MODE			
VOLTAGE	Setting Range*1	-250 V to +250 V / -500 V to +500 V	
	Setting Resolution	0.1 V	
	Accuracy*2	±(|0.5 % of set| + 0.6 V / 1.2 V)	
MAXIMUM CURRENT*3	100 V	5 A	10 A
	200 V	2.5 A	5 A
MAXIMUM PEAK CURRENT*4	100 V	20 A	40 A
	200 V	10 A	20 A
POWER CAPACITY		500 W	1000 W
*1. 100 V / 200 V range *2. For an output voltage of -250 V to -25 V, +25 V to +250 V / -500 V to -50 V, +50 V to +500 V, no load, AC volatge setting 0V (AC+DC mode) and 23℃ ± 5℃ *3. For an output voltage of 1.4 V to 100 V / 2.8 V to 200 V, Limited by the power capacity when the output voltage is 100 V to 250 V / 200 V to 500 V. *4. Within 5 ms, Limited by the maximum current.			
OUTPUT VOLTAGE STABILITY			
LINE REGULATION*1		±0.2% or less	
LOAD REGULATION*2		0.15% @45 - 65Hz; 0.5% @DC, all other frequencies (0 to 100%, via output terminal)	
RIPPLE NOISE*3		0.7 Vrms / 1.4 Vrms (TYP)	
*1. Power source input voltage is 100 V, 120 V, or 230 V, no load, rated output. *2. For an output voltage of 75 V to 175V/150V to 350V, a load power factor of 1, stepwise change from an output current of 0 A to maximum current(or its reverse), using the output terminal on the rear panel. *3. For 5 Hz to 1 MHz components in DC mode using the output terminal on the rear panel.			
OUTPUT VOLTAGE WAVEFORM DISTORTION RATIO, OUTPUT VOLTAGE RESPONSE TIME, EFFICIENCY			
OUTPUT VOLTAGE WAVEFORM DISTORTION RATIO*1		0.5 % or less	
OUTPUT VOLTAGE RESPONSE TIME*2		100 us (TYP)	
EFFICIENCY*3		70 % or more	
*1. At an output voltage of 50 V to 175 V / 100 V to 350 V, a load power factor of 1, and in AC and AC+DC mode. *2. For an output voltage of 100 V / 200 V, a load power factor of 1, with respect to stepwise change from an output current of 0 A to the maximum current (or its reverse); 10% ~ 90% of output voltage *3. For AC mode, at an output voltage of 100 V / 200 V, maximum current, and load power factor of 1 and sine wave only.			
MEASURED VALUE DISPLAY			
VOLTAGE RMS, AVG Value*1	Resolution	0.1 V	
	Accuracy*2	For 45 Hz to 65 Hz and DC: ±(0.5 % of reading + 0.3 V/0.6 V) For 40 Hz to 999.9 Hz: ±(0.7 % of reading + 0.9 V/1.8 V)	
PEAK Value	Resolution	0.1 V	
	Accuracy	For 45 Hz to 65 Hz and DC: ±(|2 % of reading| + 1 V / 2 V)	
CURRENT RMS, AVG Value	Resolution	0.01 A	0.01 A
	Accuracy*3	For 45 Hz to 65 Hz and DC:±(0.5 % of reading+0.02 A/0.02 A); For 40 Hz to 999.9 Hz:±(0.7 % of reading + 0.04 A / 0.04 A)	For 45 Hz to 65 Hz and DC:±(0.5 % of reading+0.04 A/0.02 A); For 40 Hz to 999.9 Hz:±(0.7 % of reading + 0.08 A / 0.04 A)
PEAK Value	Resolution	0.01 A	0.01 A
	Accuracy*4	For 45 Hz to 65 Hz and DC:±(|2 % of reading|+0.2 A/0.1 A)	For 45 Hz to 65 Hz and DC:±(|2 % of reading|+0.2 A/0.1 A)
POWER Active (W)	Resolution	0.1 / 1 W	0.1 / 1 W
	Accuracy*5	±(2 % of reading + 0.5 W)	±(2 % of reading + 1 W)
Apparent (VA)	Resolution	0.1 / 1 VA	0.1 / 1 VA
	Accuracy*5*6	±(2 % of reading + 0.5 VA)	±(2 % of reading + 1 VA)
Reactive (VAR)	Resolution	0.1 / 1 VAR	0.1 / 1 VAR
	Accuracy*5*7	±(2 % of reading + 0.5 VAR)	±(2 % of reading + 1 VAR)
LOAD POWER FACTOR	Range	0.000 to 1.000	0.000 to 1.000
	Resolution	0.001	0.001
LOAD CREST FACTOR	Range	0.00 to 50.00	0.00 to 50.00
	Resolution	0.01	0.01

SPECIFICATIONS

		ASR-2050/ASR-2050R	ASR-2100/ASR-2100R
HARMONIC VOLTAGE	**Range**	Up to 100th order of the fundamental wave	Up to 100th order of the fundamental wave
EFFECTIVE VALUE (RMS)	**Full Scale**	175 V / 350 V, 100%	175 V / 350 V, 100%
PERCENT (%)	**Resolution**	0.1 V, 0.1%	0.1 V, 0.1%
(AC-INT and 50/60 Hz only)	**Accuracy**[*8]	Up to 20th ± (0.2 % of reading + 0.5 V / 1 V); 20th to 100th ± (0.3 % of reading + 0.5 V / 1 V)	Up to 20th ± (0.2 % of reading + 0.5 V / 1 V); 20th to 100th ± (0.3 % of reading + 0.5 V / 1 V)
HARMONIC CURRENT	**Range**	Up to 100th order of the fundamental wave	Up to 100th order of the fundamental wave
EFFECTIVE VALUE (RMS)	**Full Scale**	5 A / 2.5 A, 100%	10 A / 5 A, 100%
PERCENT (%)	**Resolution**	0.01 A, 0.1%	0.01 A, 0.1%
(AC-INT and 50/60 Hz only)	**Accuracy**[*3]	Up to 20th ± (1 % of reading + 0.1 A / 0.05 A); 20th to 100th ± (1.5 % of reading + 0.1 A / 0.05 A)	Up to 20th ± (1 % of reading + 0.2 A / 0.1 A); 20th to 100th ± (1.5 % of reading + 0.2 A / 0.1 A)

*1. The voltage display is set to RMS in AC/AC+DC mode and AVG in DC mode.
*2. AC mode: For an output voltage of 17.5 V to 175 V / 35 V to 350 V and 23 °C ± 5 °C. DC mode: For an output voltage of 25 V to 250 V / 50 V to 500 V and 23 °C ± 5 °C.
*3. An output current in the range of 5 % to 100 % of the maximum current, and 23 °C ± 5 °C.
*4. An output current in the range of 5 % to 100 % of the maximum peak current in AC mode, an output current in the range of 5 % to 100 % of the maximum instantaneous current in DC mode, and 23 °C ± 5 °C. The accuracy of the peak value is for a waveform of DC or sine wave
*5. For an output voltage of 50 V or greater, an output current in the range of 10 % to 100 % of the maximum current, DC or an output frequency of 45 Hz to 65 Hz, and 23 °C ± 5 °C.
*6. The apparent and reactive powers are not displayed in the DC mode.
*7. The reactive power is for the load with the power factor 0.5 or lower. *8. An output voltage in the range of 17.5 V to 175 V / 35 V to 350 V and 23 °C ± 5 °C.

OTHERS

PROTECTIONS			OCP, OTP, OPP, FAN Fail
DISPLAY			TFT-LCD, 4.3 inch
MEMORY FUNCTION			10 sets for Store and Recall settings
ARBITRARY WAVE	**Number of Memories**		16 (nonvolatile)
	Waveform Length		4096 words
INTERFACE	**Standard**	**USB**	Type A: Host, Type B: Slave, Speed: 1.1/2.0, USB-CDC
		LAN	MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask
		EXT Control	External Signal Input; External Control I/O
	Factory Optional	**GPIB**	SCPI-1993, IEEE 488.2 compliant interface
		RS-232C	Complies with the EIA-RS-232 specifications
INSULATION RESISTANCE **Between input and chassis, output and chassis, input and output**			500 Vdc, 30 MΩ or more
WITHSTAND VOLTAGE **Between input and chassis, output and chassis, input and output**			1500 Vac, 1 minute
EMC			EN 61326-1 (Class A) EN 61326-2-1/-2-2 (Class A) EN 61000-3-2 (Class A, Group 1) EN 61000-3-3 (Class A, Group 1) EN 61000-4-2/-4-3/-4-4/-4-5/-4-6/-4-8/-4-11 (Class A, Group 1) EN 55011 (Class A, Group1)
Safety			EN 61010-1
Environment	**Operating Environment**		Indoor use, Overvoltage Category II
	Operating Temperature Range		0 °C to 40 °C
	Storage Temperature Range		-10 °C to 70 °C
	Operating Humidity Range		20 %rh to 80 % RH (no condensation)
	Storage Humidity Range		90 % RH or less (no condensation)
	Altitude		Up to 2000 m
DIMENSIONS & WEIGHT			ASR-2000 : 285(W)×124(H)×480(D) (not including protrusions); Approx. 11.5 kg ASR-2000R : 213(W)×124(H)×480(D) (not including protrusions); Approx. 10.5 kg

Specifications subject to change without notice. ASR-2000GD2BH

ORDERING INFORMATION

ASR-2050 500VA Programmable AC/DC Power Source
ASR-2100 1000VA Programmable AC/DC Power Source
ASR-2050R 500VA Programmable AC/DC Power Source for 3U 1/2 Rack Mount
ASR-2100R 1000VA Programmable AC/DC Power Source for 3U 1/2 Rack Mount

ACCESSORIES

CD ROM(User Manual, Programming manual), Safety Guide, Power Cord, Mains Terminal Cover Set, Remote Sense Terminal Cover Set, GTL-123 Test Lead, GTL-246 USB Cable

Note : GET-003/GET-004 are not CE approved.

OPTIONAL ACCESSORIES

Opt01 : RS-232+GPIB Communication Functions(Factory installed)
Opt02 : European Output Outlet only for ASR-2000(Factory installed)
GET-003 Extended Universal Power Socket(ASR-2000R only)
GET-004 Extended European Power Socket(ASR-2000R only)
GRA-439-E Rack Mount Kit (EIA)
GRA-439-J Rack Mount Kit (JIS)
GTL-232 RS-232C Cable, approx. 2M
GTL-258 GPIB Cable, approx. 2M, including 25 pins Micro-D connector
ASR-001 Air inlet filter
ASR-002 External three phase control unit

FREE DOWNLOAD

USB Driver

ASR-002

* Functions of ASR-Series are limited when ASR-Series applied to ASR-002
1. No DC Output(100% of Rated Power)
2. Measurement Items:only current(A),power(W)and PF for each phase
3. No voltage and current Harmonic Analysis(THDv, THDi)
4. No Remote Sensing Capability
5. No Arbitrary Waveform Function
6. No Sequence and Simulation Function(up to 10 sets)
7. Interface: only support USB
8. Not supported Built-in External Control I/O
9. No memory Function(up to 10 sets)
10. No LAN port(Built-in Web Server)