

ASR-2000 Series



NEW

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
- Memory Function (up to 10 sets)
- Sequence and Simulation Function (up to 10 sets)
- Support Arbitrary Waveform Function
- 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. Nine 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 superposition mode (AC-ADD Mode), 7) External AC/DC signal superposition 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).

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, 40th-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.



Front Panel

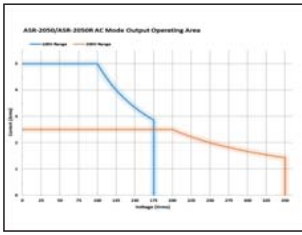


Rear Panel

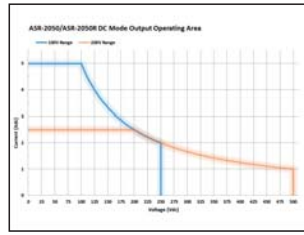
APPLICATIONS

- Electronic Products/Electronic Component Development Test
- Automotive Electrical Equipment Simulation Test
- Household Appliance Application Test

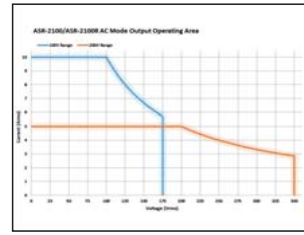
A. OPERATING AREA FOR ASR-2000 SERIES



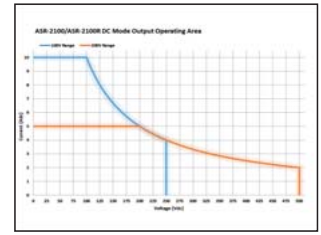
AC Output for
ASR-2050/ASR-2050R



DC Output for
ASR-2050/ASR-2050R



AC Output for
ASR-2100/ASR-2100R

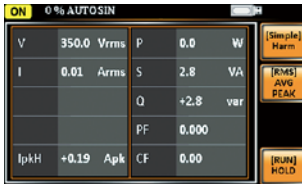


DC Output for
ASR-2100/ASR-2100R

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

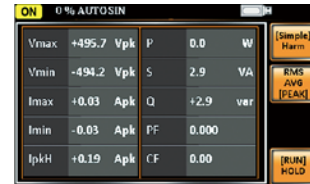
B. MEASUREMENT ITEMS FOR ASR-2000 SERIES



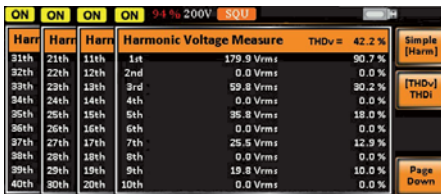
RMS Meas Display



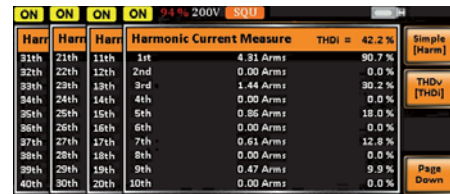
AVG Meas Display



Peak Meas Display



Voltage Harmonic

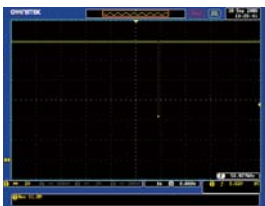


Current Harmonic

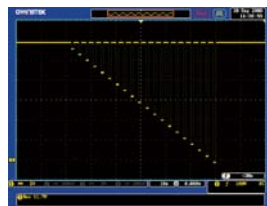
The ASR-2000 series provides users with measurement capabilities including Vrms/Irms, Vavg/Iavg and Vmax/Vmin/I max/Imin can be switched by users at any time to display the instantaneous calculation reading.

parameters including Vrms/Irms, Vavg/Iavg and Vmax/Vmin/I max/Imin can be switched by users at any time to display the instantaneous calculation reading.

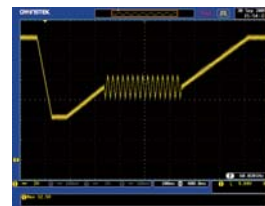
C. SEQUENCE MODE AND APPLICATIONS



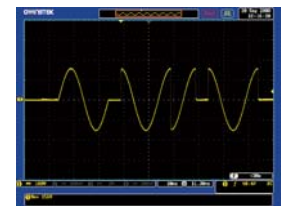
Momentary Drop in Supply Voltage



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.

SPECIFICATIONS			
		ASR-2050/ASR-2050R	ASR-2100/ASR-2100R
INPUT RATING (AC)			
NORMAL 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 voltage setting 0V (AC+DC mode) and 23°C ± 5°C			
*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
		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)
	PEAK Value	Resolution	0.1 A
		Accuracy^{*4}	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
		Accuracy^{*5}	±(2 % of reading + 0.5 W)
	Apparent (VA)	Resolution	0.1 / 1 VA
		Accuracy^{*5*6}	±(2 % of reading + 0.5 VA)
	Reactive (VAR)	Resolution	0.1 / 1 VAR
		Accuracy^{*5*7}	±(2 % of reading + 0.5 VAR)
LOAD POWER FACTOR		Range	0.000 to 1.000
		Resolution	0.001
LOAD CREST FACTOR		Range	0.00 to 50.00
		Resolution	0.01

SPECIFICATIONS		ASR-2050/ASR-2050R	ASR-2100/ASR-2100R
HARMONIC VOLTAGE EFFECTIVE VALUE (RMS) PERCENT (%) (AC-INT and 50/60 Hz only)	Range Full Scale Resolution Accuracy ^{*2}	Up to 40th order of the fundamental wave 175 V / 350 V, 100% 0.1 V, 0.01% Up to 20th ± (0.2 % of reading + 0.5 V / 1 V); 20th to 40th ± (0.3 % of reading + 0.5 V / 1 V)	Up to 40th order of the fundamental wave 175 V / 350 V, 100% 0.1 V, 0.01% Up to 20th ± (0.2 % of reading + 0.5 V / 1 V); 20th to 40th ± (0.3 % of reading + 0.5 V / 1 V)
HARMONIC CURRENT EFFECTIVE VALUE (RMS) PERCENT (%) (AC-INT and 50/60 Hz only)	Range Full Scale Resolution Accuracy ^{*3}	Up to 40th order of the fundamental wave 5 A / 2.5 A, 100% 0.01 A, 0.01% Up to 20th ± (1 % of reading + 0.1 A / 0.05 A); 20th to 40th ± (1.5 % of reading + 0.1 A / 0.05 A)	Up to 40th order of the fundamental wave 10 A / 5 A, 100% 0.01 A, 0.01% Up to 20th ± (1 % of reading + 0.2 A / 0.1 A); 20th to 40th ± (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	16 (nonvolatile)
Number of Memories	4096 words
Waveform Length	
INTERFACE	Type A: Host, Type B: Slave, Speed: 1.1/2.0, USB-CDC
Standard	LAN
USB	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	SCPI-1993, IEEE 488.2 compliant interface
GPIB	Complies with the EIA-RS-232 specifications
RS-232C	500 Vdc, 30 MΩ or more
INSULATION RESISTANCE	
Between input and chassis, output and chassis, input and output	1500 Vac, 1 minute
WITHSTAND VOLTAGE	
Between input and chassis, output and chassis, input and output	
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) EN 61010-1
Safety 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-2000GD1DH

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	

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)
GTL-258	GPIB Cable, approx. 2M, including 25 pins Micro-D connector
GRA-439-J	Rack Mount Kit (JIS)
GTL-232	RS-232C Cable, approx. 2M
ASR-001	Air inlet filter
FREE DOWNLOAD	
USB Driver	

Global Headquarters
GOOD WILL INSTRUMENT CO., LTD.
 No. 7-1, Jhongsing Road, Tucheng Dist., New Taipei City 236, Taiwan
 T +886-2-2268-0389 F +886-2-2268-0639
 E-mail: marketing@goodwill.com.tw

China Subsidiary
GOOD WILL INSTRUMENT (SUZHOU) CO., LTD.
 No. 521, Zhujiang Road, Snd, Suzhou Jiangsu 215011 China
 T +86-512-6661-7177 F +86-512-6661-7277

Malaysia Subsidiary
GOOD WILL INSTRUMENT (SEA) SDN. BHD.
 No. 1-3-18, Elit Avenue, Jalan Mayang Pasir 3, 11950 Bayan Baru, Penang, Malaysia
 T +604-6111122 F +604-6115225

Europe Subsidiary
GOOD WILL INSTRUMENT EURO B.V.
 De Run 5427A, 5504DG Veldhoven, THE NETHERLANDS
 T +31(0)40-2557790 F +31(0)40-2541194

U.S.A. Subsidiary
INSTEK AMERICA CORP.
 5198 Brooks Street Montclair, CA 91763, U.S.A.
 T +1-909-399-3535 F +1-909-399-0819

Japan Subsidiary
TEXIO TECHNOLOGY CORPORATION.
 7F Towa Fudosan Shin Yokohama Bldg., 2-18-13 Shin Yokohama, Kohoku-ku, Yokohama, Kanagawa, 222-0033 Japan
 T +81-45-620-2305 F +81-45-534-7181

Korea Subsidiary
GOOD WILL INSTRUMENT KOREA CO., LTD.
 Room No. 503, Gyeonginro 775 (Mullae-Dong 3Ga, Ace Hightech-City B/D 1Dong), Yeongduengpo-Gu, Seoul 150093, Korea.
 T +82-2-3439-2205 F +82-2-3439-2207

India Subsidiary
GW INSTEK INDIA LLP.
 No. 2707/B&C, 1st Floor UNNATHI Building, E-Block, Sahakara Nagar, Bengaluru-560 092, India
 T +91-80-6811-0600 F +91-80-6811-0626

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