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ASR-3000 Series

Programmable AC/DC Power Source

FEATURES

- Output Rating: AC 0 ~ 400 Vrms, DC 0 ~ ± 570 V
- Output Frequency up to 999.9 Hz
- DC Output (100% of Rated Power)
- Measurement Items: Vrms, Vavg, Vpeak, Irms, IpkH, Iavg, Ipeak, P, S, Q, PF, CF
- Voltage and Current Harmonic Analysis(THDv, THDi)
- Remote Sensing Capability
- OCP, OPP, OTP, AC Fail Detection and Fan Fail Alarm
- Support Arbitrary Waveform Function
- Output Capacity: 2kVA/ 3kVA/4kVA
- Customized Phase Angle for Output On/Off
- Sequence and Simulation Function(up to 10 sets)
- Interface(std): USB, LAN, RS-232, GPIB
- Built-in External Control I/O and External Signal Input
- Built-in Output Relay Control
- Memory Function (up to 10 sets)
- Built-in Web Server

GW INSTEK
Simply Reliable

The ASR-3000 Series is an AC+DC power source, featuring high-speed DC voltage rising and falling time (≦100us). There are three models of the series: ASR-3200(2kVA), ASR-3300(3kVA) and ASR-3400 (4kVA). The series can provide rated power output during AC output and DC output. Nine ASR-3000 Series 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).

ASR-3000 Series is ideal for the development of On-board Chargers, Server Powers, LED modules, AC Motors, AC Fans, UPS and various electronic components, as well as for testing applications of automotive electrical equipment and home appliances.

The ASR-3000 Series provides users with waveform output capabilities 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-3000 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 sensing function ensures accurate voltage output, and the Customized Phase Angle for Output On/Off function can set the start and end angles of the voltage output according to the test requirements. The protection limits of V-Limit, Ipeak-Limit and F-Limit can be set according to user requirements. Over voltage limit, OCP, OPP will protect the DUT during the output process. The Fan Fail Alarm function and the AC fail alarm function are also designed in the ASR-3000 Series.

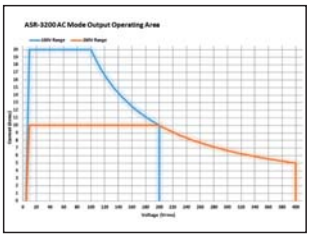
The front panel of the ASR-3000 Series provides a universal socket or a European socket, which allows users to plug and use so as to save wiring time. Since the power socket specification has a maximum current of 15A, the rear panel of ASR-3000 Series is designed with a current circuit breaker. When the socket current is greater than 15A, it will automatically open the circuit to protect users. The ASR-3000 Series supports I/O interface and is standardly equipped with USB, LAN, External I/O, RS-232C and GPIB.

PANEL INTRODUCTION

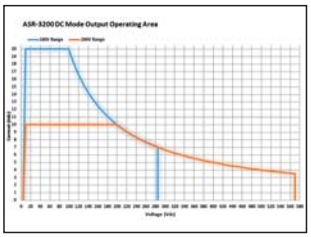
CE | RS-232 | USB | LAN | Ext I/O | GPIB

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. GPIB Connector
14. Remote Sensing Input Terminal
15. Output Terminal
16. Line Input
17. External Signal Input/External Synchronized Signal Input
18. RS-232C Connector
19. LAN Connector
20. USB Interface Connector(B Type)
21. Circuit Breaker

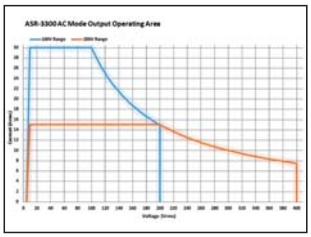
A. OPERATING AREA FOR ASR-3000 SERIES



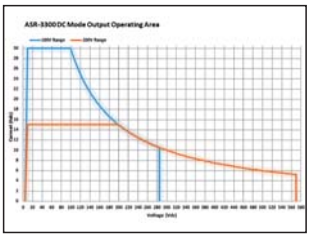
AC Output for ASR-3200



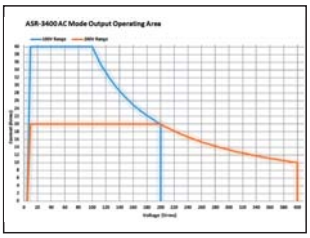
DC Output for ASR-3200



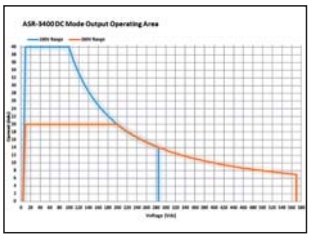
AC Output for ASR-3300



DC Output for ASR-3300



AC Output for ASR-3400



DC Output for ASR-3400

Model Name	Power Rating	Max. Output Current	Max. Output Voltage
ASR-3200	2k VA	20 / 10 A	400 Vrms / ±570 Vdc
ASR-3300	3k VA	30 / 15 A	400 Vrms / ±570 Vdc
ASR-3400	4k VA	40 / 20 A	400 Vrms / ±570 Vdc

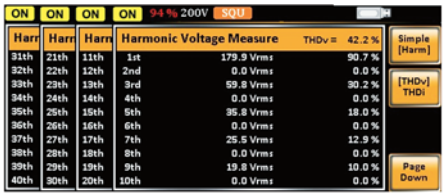
The ASR-3000 series is an AC + DC power source that provides not only rated power output for AC output, but also rated power output for DC output.

B. MEASUREMENT ITEMS FOR ASR-3000 SERIES

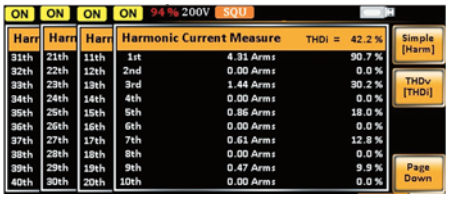
RMS Meas Display

AVG Meas Display

Peak Meas Display



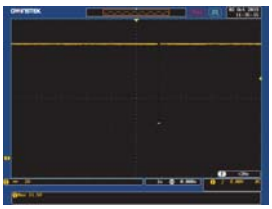
Voltage Harmonic



Current Harmonic

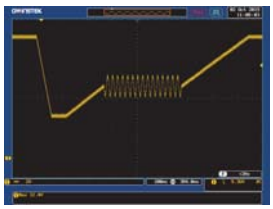
The ASR-3000 Series provides users with measurement capabilities including Vrms, Vavg, Vpeak, Irms, Iavg, Ipeak, IpkH, P, S, Q, PF, CF, 40th-order Voltage Harmonic and Current Harmonic. During the power output, the measurement parameters including Vrms/Irms, Vavg/Iavg and Vmax/Vmin/ Imax/ Imin can be switched by users at any time to display the instantaneous calculation reading.

C. SEQUENCE MODE AND BUILT-IN ISO-16750-2 WAVEFORMS

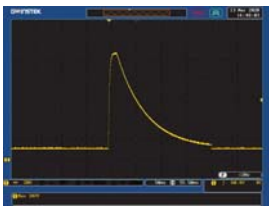


SEQ6: Momentary Drop in Supply Voltage

SEQ7: Reset Behavior at Voltage Drop with 12V System



SEQ8: Starting Profile Waveform

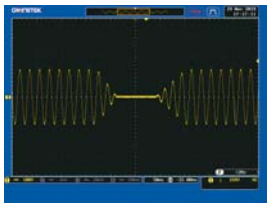


SEQ9: Load Dump with Tr_10ms, Td_40ms

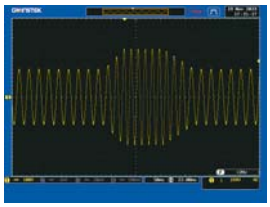
The sequence mode provides editable 10 sets of SEQ0~SEQ9, each set has 0~999 steps, each step time setting range is 0.0001~999.9999 seconds. Users can combine multiple sets of steps to generate the required waveforms, including waveform falling, surges, sags and other abnormal power line conditions to meet the needs of the test applications.

In addition, ASR-3000 Series also built in common ISO-16750-2 test waveforms in the Sequence Mode preset waveforms, including Momentary Drop in Supply Voltage built in at SEQ6, Reset Behavior at Voltage Drop with 12V system built in at SEQ7, Starting Profile Waveform built in at SEQ8 and Load Dump with Tr_10ms, and Td_40ms built in at SEQ9.

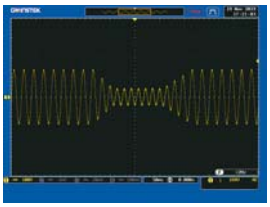
D. SIMULATE MODE



Power Outage



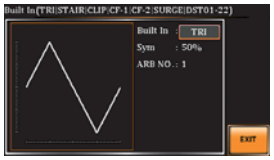
Voltage Rise



Voltage Fall

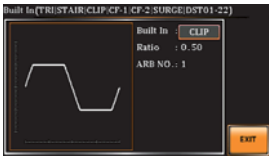
Simulate Mode can quickly simulate different transient waveforms, such as power outage, voltage rise, voltage fall, etc., for engineers to evaluate the impact of transient phenomena on the DUT. Ex: Capacitance durability test.

E. FUNCTION WAVEFORM (ARBITRARY EDIT) MODE

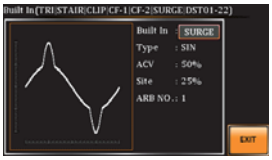


TRI Waveform

STAIR Waveform



CLIP Waveform



SURGE Waveform

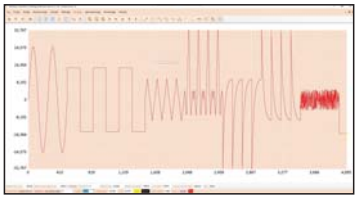
Fourier Series Synthesized Waveform

ASR-3000 Series provides more than 20,000 waveform combinations in seven categories, allowing users to quickly simulate different AC voltage waveforms. Adjust the desired waveform type directly through the panel (displayed synchronously on the screen), then the waveform is loaded into the ARB 1~16 waveform register through the access procedures, and return to the main menu output mode to perform ARB Waveform output.

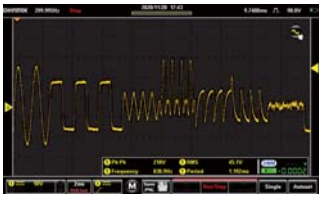
F. PC SOFTWARE

Basic Controller

Sequence Mode



ARB Waveform Edit

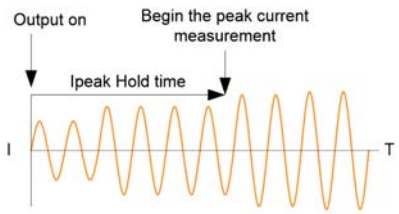


The Waveform is Observed with DSO

The ASR-3000 Series software includes basic settings, the Simulate Mode, the Sequence Mode, Data Log and the arbitrary waveform editing function. Users can directly set output voltage, frequency, start/stop phase on ASR-3000 Series through the software.
The Simulate Mode can quickly simulate different transient waveforms such as power outage, voltage rise, voltage fall... etc.

The Sequence Mode can edit the editing parameters read back from ASR-3000 Series, or directly edit the parameters and control ASR-3000 Series to output waveforms according to the set sequence. The arbitrary waveform editing function not only combines various waveforms, including sine waves, square waves, triangle waves, and noise waveforms, but also allows uses to draw arbitrary waveforms and output them.

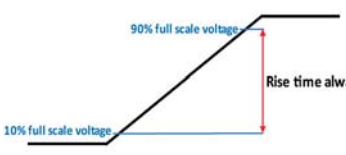
G. T, IPK HOLD & IPK, HOLD FUNCTIONS



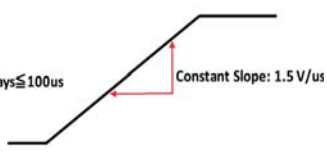
T, Ipk Measurement

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.

H. SLEW RATE MODE



Time Mode



Slope Mode

The ASR-3000 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-3000 Series can increase output to 10~90% of the set voltage within 100μs; and when selecting "Slope" mode, ASR-3000 Series 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-3000 Series voltage by editing the Sequence mode.

SPECIFICATIONS

		ASR-3200	ASR-3300	ASR-3400
INPUT RATING (AC)				
NORMINAL INPUT VOLTAGE		200 Vac to 240 Vac	200 Vac to 240 Vac	200 Vac to 240 Vac
INPUT VOLTAGE RANGE		180 Vac to 264 Vac	180 Vac to 264 Vac	180 Vac to 264 Vac
PHASE		Single phase, Two-wire	Single phase, Two-wire	Single phase, Two-wire
NORMINAL INPUT FREQUENCY		50 Hz to 60 Hz	50 Hz to 60 Hz	50 Hz to 60 Hz
INPUT FREQUENCY RANGE		47 Hz to 63 Hz	47 Hz to 63 Hz	47 Hz to 63 Hz
MAX. POWER CONSUMPTION		2500 VA or less	3750 VA or less	5000 VA or less
POWER FACTOR*1	200Vac	0.95 (TYP)	0.95 (TYP)	0.95 (TYP)
MAX. INPUT CURRENT	200Vac	15 A	22.5 A	30 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 200.0 V / 0.0 V to 400.0 V		
	Setting Resolution	0.1 V		
	Accuracy*2	±(1 % of set + 1 V / 2 V)		
OUTPUT PHASE		Single phase, Two-wire		
MAXIMUM CURRENT*3	100 V	20 A	30 A	40 A
	200 V	10 A	15 A	20 A
MAXIMUM PEAK CURRENT*4	100 V	120 A	180 A	240 A
	200 V	60 A	90 A	120 A
LOAD POWER FACTOR		0 to 1 (leading phase or lagging phase)	0 to 1 (leading phase or lagging phase)	0 to 1 (leading phase or lagging phase)
POWER CAPACITY		2000 VA	3000 VA	4000 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	0.02% of set (23 °C ± 5 °C)		
	Stability*5	± 0.005%		
OUTPUT ON PHASE		0° to 359° variable (setting resolution 1°)		
DC OFFSET*6		Within ± 20 mV (TYP)		
*1. 100 V / 200 V range *2. For an output voltage of 20 V to 200 V / 40 V to 400 V, an output frequency of 45 Hz to 65 Hz, no load, and 23℃ ± 5℃ *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 200 V / 200 V to 400 V. If there is the DC superimposition, the current of AC+DC mode satisfies the maximum current. In the case of lower than 40 Hz, and the power rating temperature, the maximum current will be decrease. *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 23°C ± 5°C.				
OUTPUT RATING FOR DC MODE				
VOLTAGE	Setting Range*1	-285 V to + 285 V / -570 V to +570 V		
	Setting Resolution	0.1 V		
	Accuracy*2	±(1 % of set + 1 V / 2 V)		
MAXIMUM CURRENT*3	100 V	20 A	30 A	40 A
	200 V	10 A	15 A	20 A
MAXIMUM PEAK CURRENT*4	100 V	120 A	180 A	240 A
	200 V	60 A	90 A	120 A
POWER CAPACITY		2000 W	3000 W	4000 W
*1. 100 V / 200 V range *2. For an output voltage of -285 V to -28.5 V, +28.5 V to +285 V / -570 V to -57 V, +57 V to +570 V, no load, 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. Limited by the maximum current.				
OUTPUT VOLTAGE STABILITY				
LINE REGULATION*1		±0.2% or less		
LOAD REGULATION*2		0.5% or less (0 to 100%, via output terminal)		
RIPPLE NOISE*3		1 Vrms / 2 Vrms (TYP)		
*1. Power source input voltage is 200 V, 220 V, or 240 V, no load, rated output. *2. For an output voltage of 100 V to 200 V / 200 V to 400 V, 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				
TOTAL HARMONIC DISTORTION(THD)*1		≦ 0.2% @50/60Hz, ≦ 0.3% @<500Hz, ≦ 0.5% @500.1Hz~999.9Hz		
OUTPUT VOLTAGE RESPONSE TIME*2		100 us (TYP)		
EFFICIENCY*3		80 % or more		
*1. At an output voltage of 50 V to 200 V / 100 V to 400 V, a load power factor of 1, and in AC 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). *3. For AC mode, at an output voltage of 100 V / 200 V, maximum current, and load power factor of 1.				
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 + 0.5 V/1 V); For all other frequencies: ±(0.7 % of reading + 1 V / 2 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	0.01 A
	Accuracy*3	For 45 Hz to 65 Hz and DC:±(0.5 % of reading+0.1 A/0.05 A); For all other frequencies:±(0.7 % of reading+0.2 A/0.1 A)	For 45 Hz to 65 Hz and DC:±(0.5 % of reading+0.15 A/0.08 A); For all other frequencies:±(0.7 % of reading+0.3 A/0.15 A)	For 45 Hz to 65 Hz and DC:±(0.5 % of reading+0.2 A/0.1 A); For all other frequencies:±(0.7 % of reading+0.4 A/0.2 A)
PEAK Value	Resolution	0.1 A	0.1 A	0.1 A
	Accuracy*4	For 45 Hz to 65 Hz and DC:±(|2 % of reading| + 0.5 A/0.25 A)	For 45 Hz to 65 Hz and DC:±(|2 % of reading| + 0.8 A/0.4 A)	For 45 Hz to 65 Hz and DC:±(|2 % of reading| + 1 A/0.5 A)
POWER Active (W)	Resolution	1 W	1 W	1 W
	Accuracy*5	±(2 % of reading + 2 W)	±(2 % of reading + 3 W)	±(2 % of reading + 4 W)
Apparent (VA)	Resolution	1 VA	1 VA	1 VA
	Accuracy*5*6	±(2 % of reading + 2 VA)	±(2 % of reading + 3 VA)	±(2 % of reading + 4 VA)
Reactive (VAR)	Resolution	1 VAR	1 VAR	1 VAR
	Accuracy*5*7	±(2 % of reading + 2 VAR)	±(2 % of reading + 3 VAR)	±(2 % of reading + 4 VAR)
LOAD POWER FACTOR	Range	0.000 to 1.000	0.000 to 1.000	0.000 to 1.000
	Resolution	0.001	0.001	0.001
LOAD CREST FACTOR	Range	0.00 to 50.00	0.00 to 50.00	0.00 to 50.00
	Resolution	0.01	0.01	0.01
HARMONIC VOLTAGE	Range	Up to 40th order of the fundamental wave	Up to 40th order of the fundamental wave	Up to 40th order of the fundamental wave
EFFECTIVE VALUE (RMS)	Full Scale	200 V / 400 V, 100%	200 V / 400 V, 100%	200 V / 400 V, 100%
PERCENT (%)	Resolution	0.1 V, 0.1%	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 40th±(0.3 % of reading+0.5 V/1 V)	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 20th±(0.2 % of reading+0.5 V/1 V); 20th to 40th±(0.3 % of reading+0.5 V/1 V)
HARMONIC CURRENT	Range	Up to 40th order of the fundamental wave	Up to 40th order of the fundamental wave	Up to 40th order of the fundamental wave
EFFECTIVE VALUE (RMS)	Full Scale	20 A / 10 A, 100%	30 A / 15 A, 100%	40 A / 20 A, 100%
PERCENT (%)	Resolution	0.01 A, 0.1%	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 + 0.4 A / 0.2 A); 20th to 40th ± (1.5 % of reading + 0.4 A / 0.2 A)	Up to 20th ± (1 % of reading + 0.6 A / 0.3 A); 20th to 40th ± (1.5 % of reading + 0.6 A / 0.3 A)	Up to 20th ± (1 % of reading + 0.8 A / 0.4 A); 20th to 40th ± (1.5 % of reading + 0.8 A / 0.4 A)

SPECIFICATIONS

	ASR-3200	ASR-3300	ASR-3400

*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 20 V to 200 V / 40 V to 400 V and 23 °C ± 5 °C. DC mode: For an output voltage of 28.5 V to 285 V / 57 V to 570 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 20 V to 200 V / 40 V to 400 V and 23 °C ± 5 °C.

OTHERS

PROTECTIONS			UVP, OCP, OTP, OPP, FAN Fail
DISPLAY			TFT-LCD, 4.3 inch
MEMORY FUNCTION			Store and recall settings, Basic settings: 10 (0~9 numeric keys)
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, USB-TMC
		LAN	MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask
		RS-232C	Complies with the EIA-RS-232 specifications
		EXT Control	External Signal Input; External Control I/O
		GPIB	SCPI-1993, IEEE 488.2 compliant interface
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, EN 61326-2-1, EN 61000-3-2, EN 61000-3-3, EN 61000-3-11, EN 61000-3-12, EN 61000-4-2/-4-3/-4-4/-4-5/-4-6/-4-8/-4-11/-4-34, EN 55011 (Class A), EN 55032
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			430(W)×176(H)×550(D)mm (not including protrusions); Approx. 25 kg

Specifications subject to change without notice. ASR-3000CD1DH

ORDERING INFORMATION

ASR-3200 2kVA Programmable AC/DC Power Source
ASR-3300 3kVA Programmable AC/DC Power Source
ASR-3400 4kVA Programmable AC/DC Power Source

ACCESSORIES

CD (User Manual/Programming Manual), Safety Guide, Input Terminal Cover, Output Terminal Cover Include Remote Sensing, GRA-442-E Rack Mount Adapter(EIA), GTL-246 USB Cable

OPTIONAL ACCESSORIES

GPW-005 Power Cord, 3m, 105℃, UL/CSA Type
GPW-006 Power Cord, 3m, 105℃, VDE Type
GPW-007 Power Cord, 3m, 105℃, PSE Type
GRA-442-J Rack Mount Adapter(JIS)
GTL-137 Output Power Wire(Load wire_ 10AWG: 50A, 600V/ Sense wire_ 16AWG: 20A, 600V)
GTL-232 RS232C cable, approx. 2m
GTL-248 GPIB Cable, approx. 2m
ASR-002 External Three Phase Control Unit
APS-008 Air inlet filter

* European Output Outlet(factory installed)

ASR-002

APS-008

GPW-005

GRA-442-J

GTL-137

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Simply Reliable