GW Instek ASR-3400HF

Programmable AC/DC Power Source

New Product Announcement

This document allows GW Instek's partners to quickly grasp product's main features and ordering information.

ASR-3400HF Programmable AC/DC Power Source

New Product Announcement

ASR-3400HF, a new member of the ASR-3000 series, provides the same output capacity and function as that of ASR-3400. The only difference is that ASR-3400HF output frequency can reach 5 kHz (Crest factor = 4).

The AC output frequency of ASR-3400HF is up to 5 kHz, which is suitable for avionics industry equipment while operating at nominal 400 Hz, 800 Hz or up to 5,000 Hz for conducting immunity tests.

	Model		ASR-3400	ASR-3400HF
AC Input	Input Voltage (V)		**180 - 264**	**180 - 264**
	Phase		1P2W	1P2W
	Input Frequency (Hz)		47 - 63	47 - 63
	Efficiency (%)		**80**	**80**
AC Output	Output Capacity (VA)		4000	4000
	Output Range (V)		**200 / 400**	**200 / 400**
	Maximum Output Current (A)	Low	40	40
		High	20	20
	Crest Factor		**6**	**4**
	Frequency (Hz)		1.0 - 999.9	**1.0 - 5000**
	Total Harmonic Distortion (%)		≦0.5	≦2.0
DC Output	Output Capacity (W)		4000	4000
	Output Range (Vp-p)		**±285 / ±570**	**±285 / ±570**
	Maximum Output Current (A)	Low	40	40
		High	20	20

Difference between ASR-3400 and ASR-3400HF

Features

- Output Rating: AC 0 – 400 Vrms,

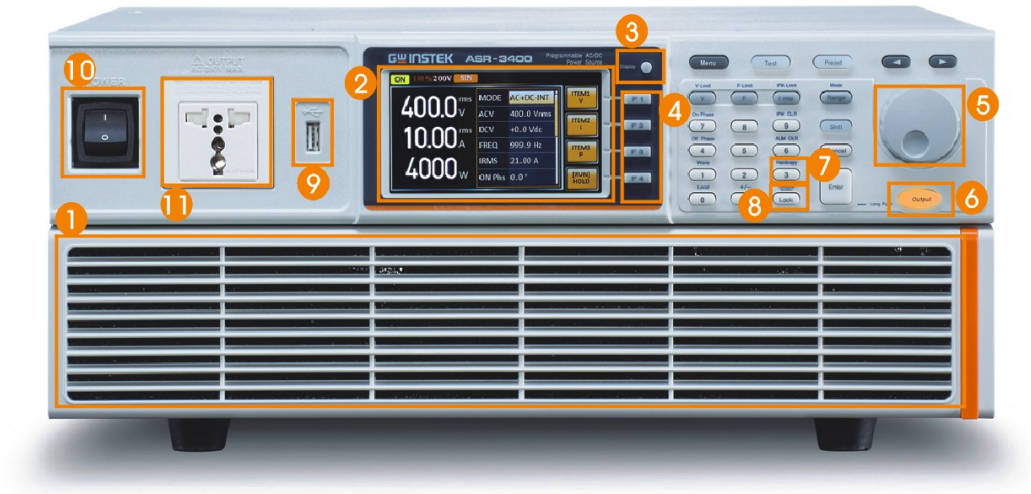
  DC 0 - ± 570 V
- Output Frequency up to 999.9 Hz (ASR-3400HF up to 5000Hz)
- DC Output (100% of Rated Power)
- Measurement Items: Vrms, Vavg, Vpeak, Irms, IpkH, Iavg, Ipeak, P, S, Q, PF, CF
- Voltage and Current Harmonic Analysis(THDv, THDi)
- Remote Sensing Capability
- OCP, OPP, OTP, AC Fail Detection and Fan Fail Alarm.
- Support Arbitrary Waveform Function
- Output Capacity: 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

Applications

Electronic products / electronic component development test
Immunity tests for avionics industrial equipment
Automotive electrical device simulation test
Household appliance application test
On-board Chargers
Server Powers
LED modules
AC Motors
AC Fans
UPS

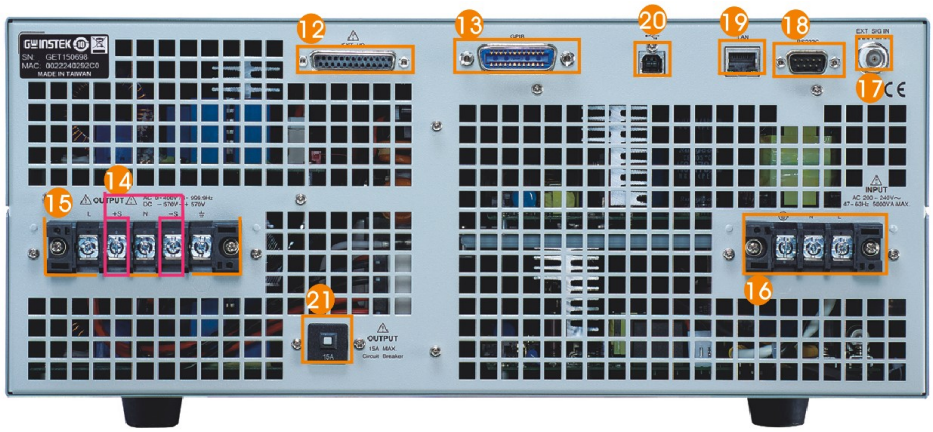
Appearance

Front panel



ASR-3000 Series

Rear panel



ASR-3000 Series

Front panel	Rear panel
1. Air inlet	12. External I/O connector
2. LCD screen	13. GPIB connectors
3. Display mode select key	14. Remote sensing input terminal
4. Function keys	15. Output terminal
5. Scroll wheel	16. Line input
6. Output key	17. External signal input / External synchronized signal input
7. Hardcopy key	
8. Lock/Unlock button	18. RS-232C connector
9. USB interface connector (A Type)	19. LAN connector
10. Power switch button	20. USB interface connector(B Type)
11. Output socket	21. Circuit Breaker

Important Information of Product Ordering

Key Dates for Product Announcement

1. NPI release and sample order (September 16th, 2022)
2. Global announcement (September 16th, 2022)

Service Policy

1. ASR-3400HF Programmable AC/DC Power Source carries two year warranty
2. Contact GW Instek Service Department for maintenance information.

Ordering Information

ASR-3400HF *(Universal outlet)*	4kVA Programmable AC/DC Power Source	***Part Number:*** *01SR34HF10GT* ***EAN Code:*** *4713008678077*
ASR-3400HF *(European outlet)*	4kVA Programmable AC/DC Power Source	***Part Number:*** *01SR34HF30GT* ***EAN Code:*** *4713008678091*

Standard 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 (factory installed)

European Output Outlet

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(CE application in progress)

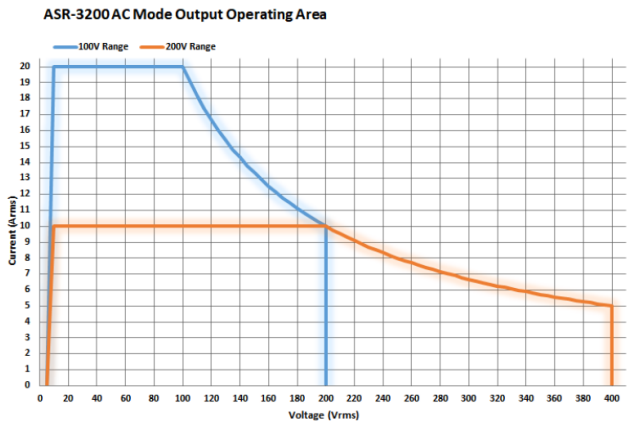
APS-008 Air inlet filter

Detailed Descriptions for Features

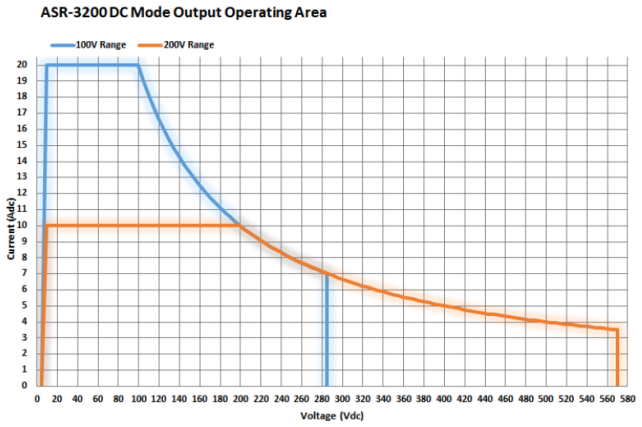
Operating Mode

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	400Vrms / ±570 Vdc
ASR-3400	4k VA	40 / 20 A	400 Vrms / ±570 Vdc
ASR-3400HF	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. The operation areas are shown below:

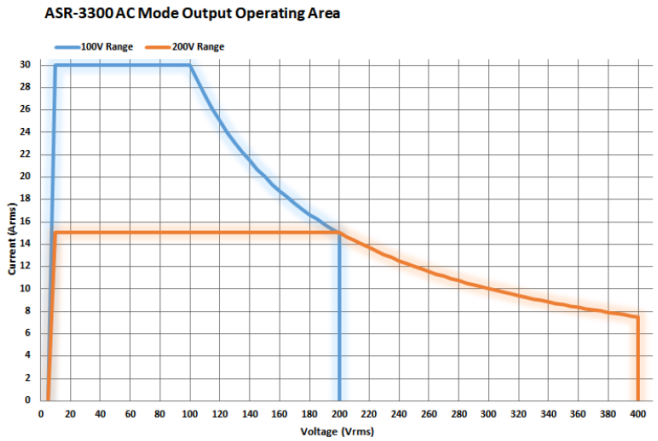


AC Output Mode

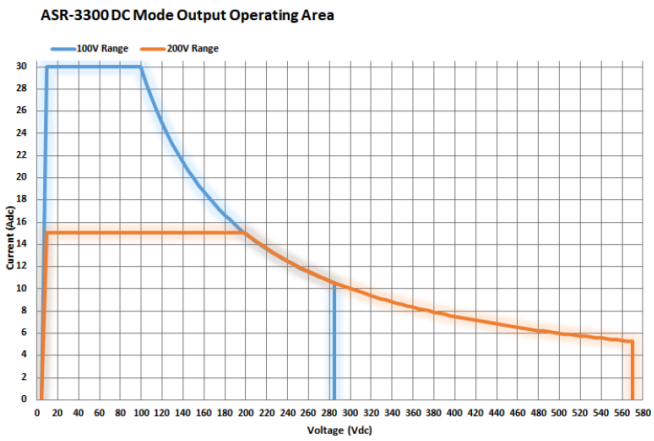


DC Output Mode

ASR-3200 Operating Range

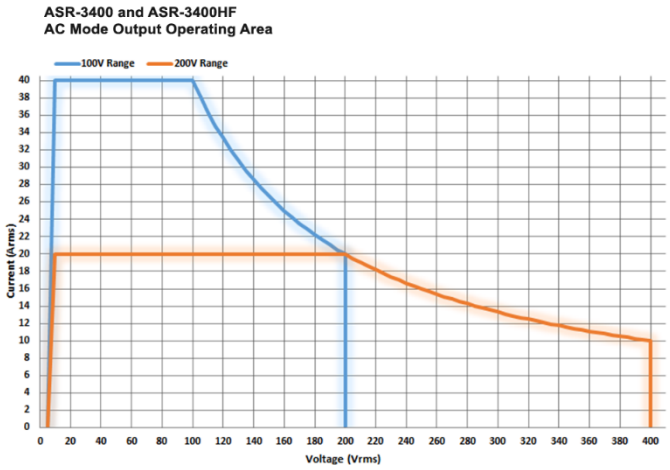


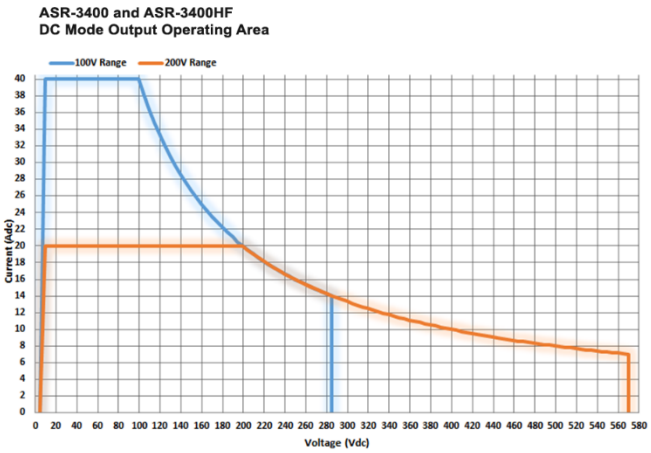
AC Output Mode



DC Output Mode

ASR-3300 Operating Range



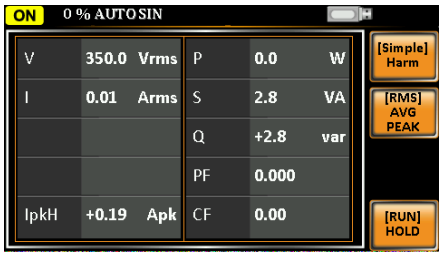


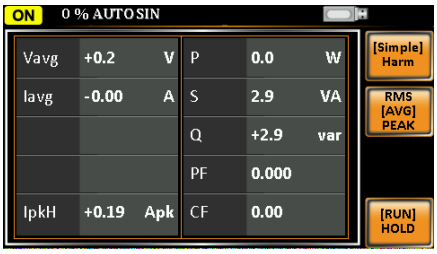
AC Output Mode DC Output Mode

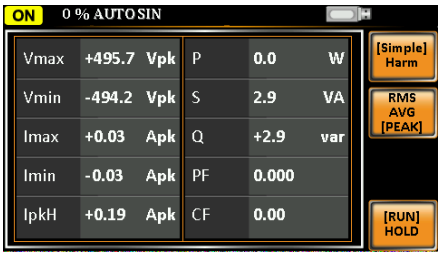
ASR-3400/ASR-3400HF Operating Range

Measurement Items

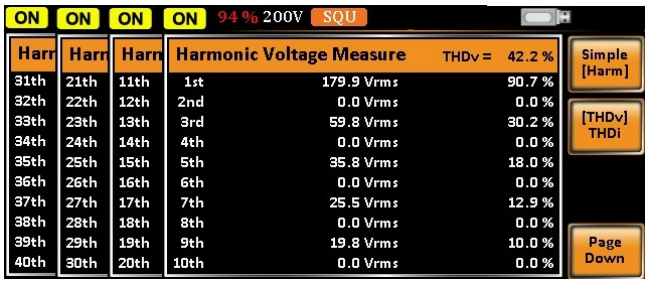
The ASR-3000 Series provides users with measurement capabilities including Vrms, Vavg, Vpeak, Irms, Iavg, Ipeak, IpkH, P, S, Q, PF, CF, 40th-order Voltage Harmonic and Current Harmonic. During the power output, the measurement parameters including Vrms/Irms, Vavg/Iavg and Vmax/Vmin/ Imax/ Imin can be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

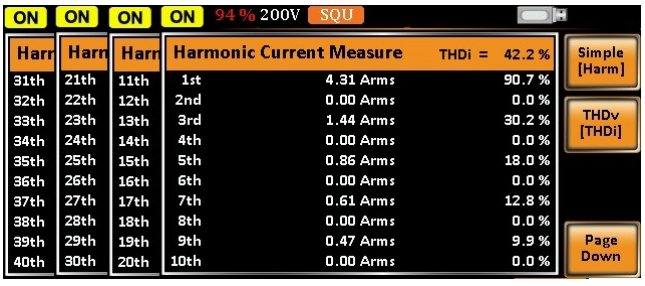






RMS Meas Display AVG Meas Display Peak Meas Display

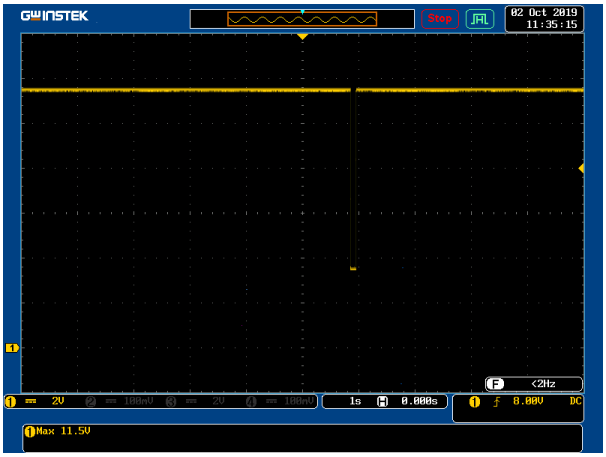




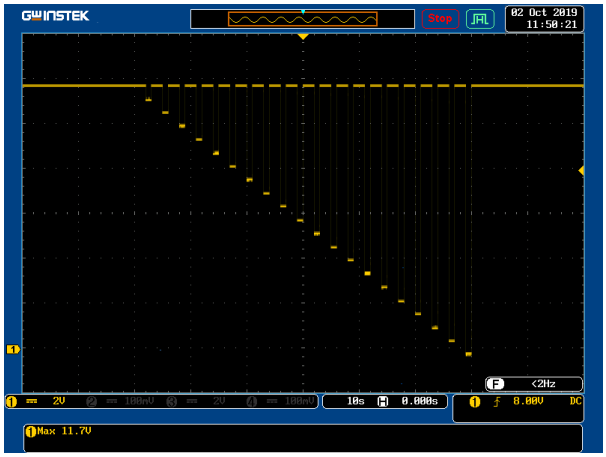
Voltage Harmonic Current Harmonic

Sequence Mode and built-in ISO-16750-2 waveforms

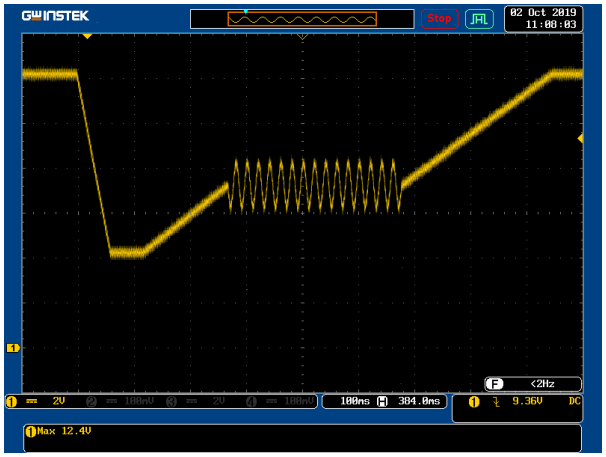
The sequence mode provides editable 10 sets of SEQ0~SEQ9, each set has 0~999 steps, each step time setting range is 0.0001~999.9999 seconds. Users can combine multiple sets of steps to generate the required waveforms, including waveform falling, surges, sags and other abnormal power line conditions to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



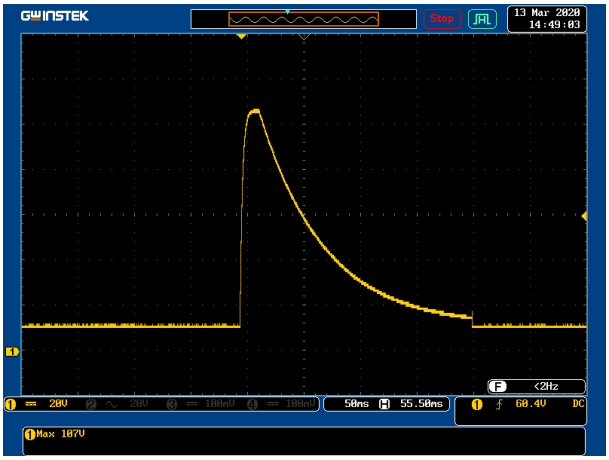
SEQ6: Momentary Drop in Supply Voltage



SEQ7:Reset Behavior at Voltage Drop with 12V System



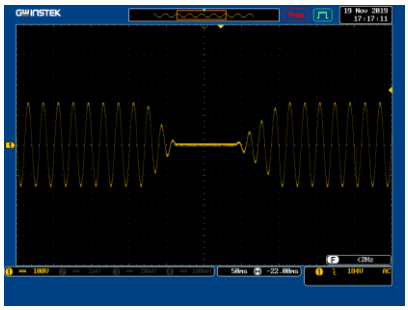
SEQ8: Starting Profile Waveform



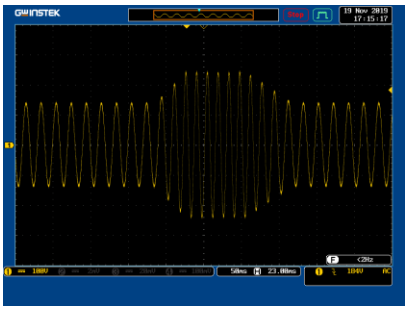
SEQ9: Load Dump with Tr_10ms, Td_40ms

Simulate Mode

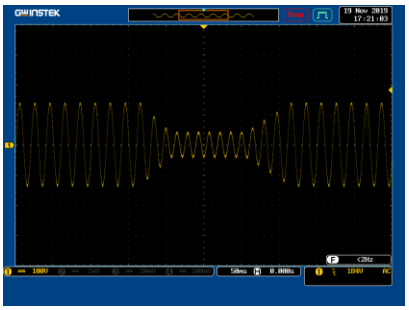
Simulate Mode can quickly simulate different transient waveforms, such as power outage, voltage rise, voltage fall, etc., for engineers to evaluate the impact of transient phenomena on the DUT. Ex: Capacitance durability test.



Power Outage



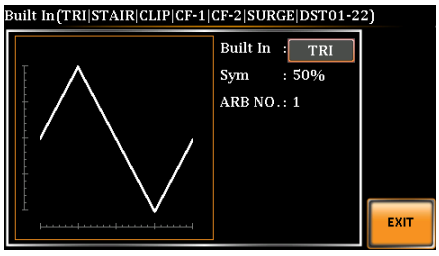
Voltage Rise



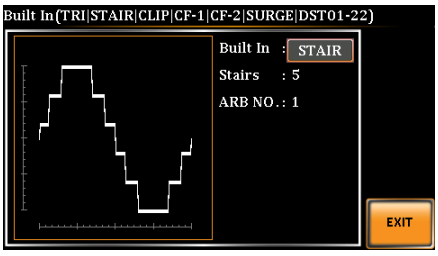
Voltage Fall

Function Waveform (Arbitrary Edit) Mode

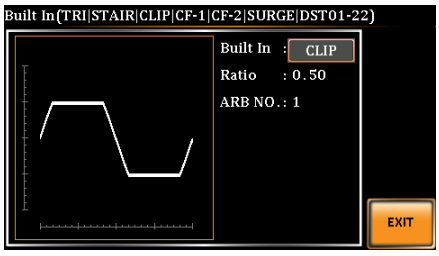
ASR-3000 Series provides more than 20,000 waveform combinations in seven categories, allowing users to quickly simulate different AC voltage waveforms. Adjust the desired waveform type directly through the panel (displayed synchronously on the screen), then the waveform is loaded into the ARB 1~16 waveform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



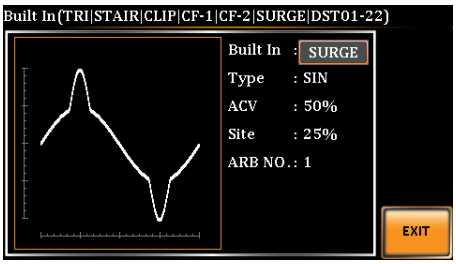
T, TRI waveform



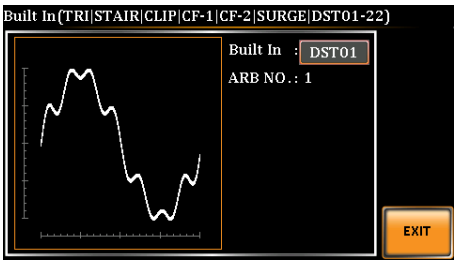
STAIR waveform



CLIP waveform



SURGE waveform



Fourier Series Synthesized waveform

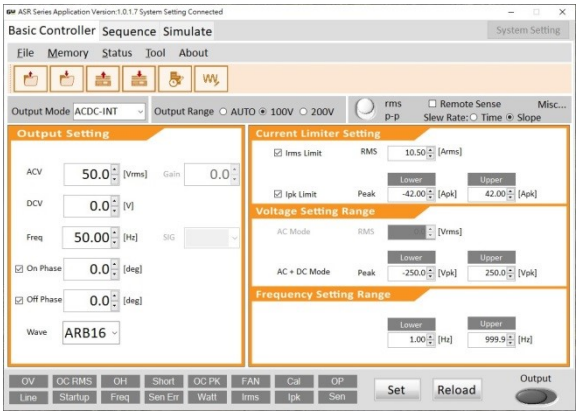
PC Software

TThe 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.

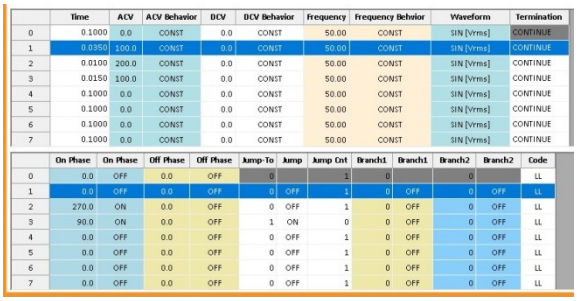
The Simulate Mode can quickly simulate different transient waveforms such as power outage, voltage rise, voltage fall... etc.

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.

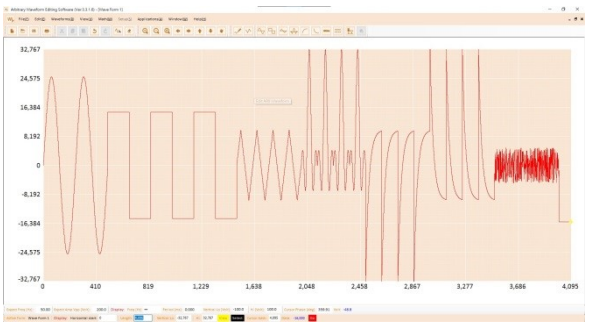
The arbitrary waveform editing function not only combines various waveforms, including sine waves, square waves, triangle waves, and noise waveforms, but also allows uses to draw arbitrary waveforms and output them.



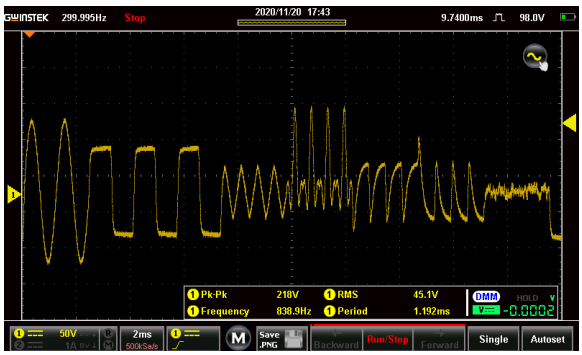
Basic Controller



Sequence Mode



ARB Waveform Edit

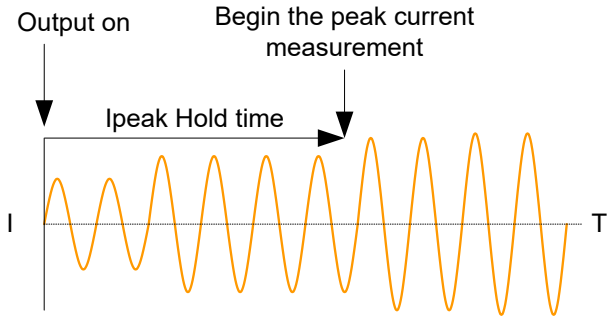


The waveform is observed with DSO

T, Ipk Hold & Ipk, Hold functions

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.

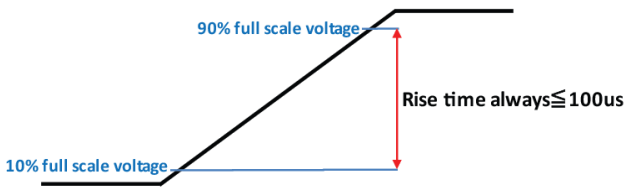


(T, Ipk Measurement)

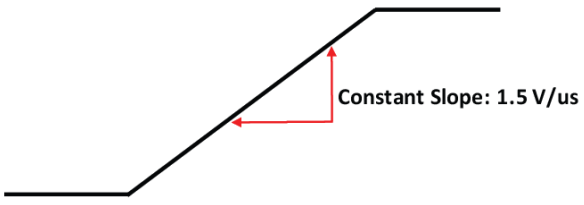
Slew Rate Mode

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.



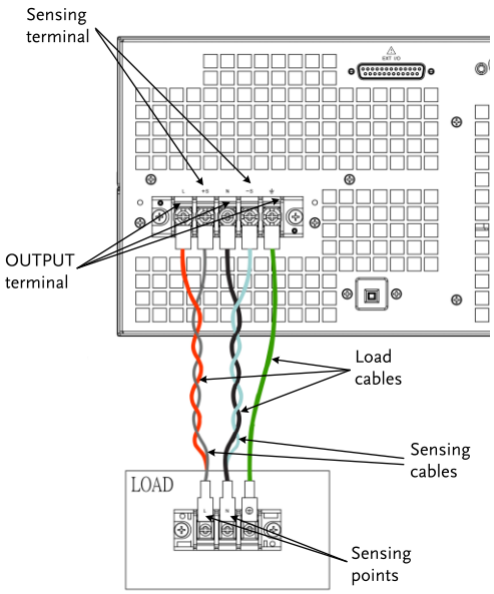
Time mode



Slope mode

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-3000 Series provides the remote sense function that can sense the voltage drop of the DUT to the ASR-3000 Series and the DUT will be compensated by the ASR-3000 Series. The maximum voltage that the remote sense function can compensate is 5% of the output voltage.



(Remote Sense Diagram)

Features, Advantages and Benefits

Features	Advantages	Benefits
Vrms, Vavg, Vpeak, Irms, Iavg, Ipeak, IpkH, P, S, Q, PF, CF, 40th-order Voltage Harmonic and Current Harmonic measurement Functions	Provide complete AC power measurements	Provide the most complete power measurements in AC source of the same category. Even S, CF, and Voltage Harmonic are included.
Sequence mode	Incorporate AC and DC settings to meet user demands for highly complicate waveforms	For users to generate test waveforms according to different needs, including 1) simulate different input power, and 2) generate various test waveforms.
Simulate mode	Simulate various AC power outputs	Convenient for users to quickly generate a variety of abnormal AC power outputs
Nine power output modes include 1) AC power output mode (AC-INT Mode), 2) DC power output mode (DC-INT), 3) AC/DC power output mode (AC+DC-INT)	The ASR-3000 Series voltage output modes can be AC, DC, AC+DC, Power Amplifier,	Meet user's different test application requirements with one power source, including AC,

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).	external signal superimposition output mode.	DC, signal amplification, and signal superimposition.
AC 0 ~ 400.0V DC -570 ~ +570V Wide power output range	ASR-3000 Series offers a wider range of applications than the AC/DC power sources of the same power category from other brands.	The wide-range power output can cover a wider range of power applications. For example: single phase voltage AC 277V±10% test application in the United States or 344Vac LED driver test.
Remote Sense Function	Compensate for the voltage drop caused by current passing through the load cables, which affects the measurement results	During the measurement process, users do not need to worry about the difference in the measured value due to the change of the current.
Ipk Hold and T, Ipk Hold functions	Measure the surge current during the power on of the DUT	Users can complete the measurement of surge current without oscilloscope and current probe
Universal socket	Applicable to all regional outlets	Users can set and use with plug-in, saving terminal wiring time
ASR-3000 Series provides sine, square, triangle, and 16 ARB waveforms for user applications.	Users can quickly convert the original output waveform into another output waveform without complicated settings.	Users can quickly apply different test waveforms - test to evaluate the DUT
PC Software and Data Log function	Through the simple setting of the software, users can edit the sequential power output and generate complex arbitrary waveforms. The Data Log function can provide measurement records during the ASR-3000 Series measurement process.	Shorten the time for users to edit and generate waveforms and the procedures for setting. After the measurement is over, the provided data from Data Log can be directly used by users to record and analyze.

Features Comparison

	Brand			GWINSTEK	NF	Chroma	ITECH
	Model		Unit	ASR-3200 ASR-3300 ASR-3400 ASR-3400HF	DP015S DP030S DP045S	61503 61504 61505	IT7624 IT7625 IT7626
Input	Phase			Single Phase	Single Phase	Single Phase	Single Phase
	Voltage		V	180 ~ 264 Vac	100 ~ 230 Vac ± 10%	90 ~ 250 Vac 190 ~ 250 Vac (three phase) *1	110Vac ± 10% or 220Vac ± 10% 380Vac ± 10% (Y) *2
	Frequency		Hz	47 ~ 63	50 ± 2 or 60 ± 2	47 ~ 63	47 ~ 63
	Power Factor			0.95 typ. @100V Input	0.95 typ. @100V Input	0.97 Min.	0.7 typ.
AC Output	Output Capacity		VA	2000 / 3000 / 4000	1500 / 3000 / 4500	1500 / 2000 / 4000	1500 / 3000 / 4500
	Output Range		V	200 / 400 / Auto	155 / 310	150 / 300 / Auto	150 / 300
	Output Current	Low	A	20 / 30 / 40	15 / 30 / 40	12 / 16 / 32	12 / 24 / 36
		High	A	10 / 15 / 20	7.5 / 15 / 20	6 / 8 / 16	6 / 12 / 18
	Frequency		Hz	1 - 999.9	1 - 550	15 - 1k	10 - 5k
	Phase			1P2W	1P2W	1P2W	1P2W or 3P4W
	Total Harmonic Distortion		%	ASR-3200/3300/3400: <0.2 % @50/60 Hz <0.3 % @<500 Hz <0.5 % @500.1 Hz to 999.9 Hz ASR-3400HF < 0.2% @50/60Hz < 0.5% @<500Hz < 1.0% @500.1Hz~2000Hz < 2.0% @2001Hz~5000Hz	≦0.5 @40 - 550Hz	0.3% @50/60Hz 1% @15 - 1kHz	0.5% @10 - 500Hz 2% @501 - 5kHz
	Crest Factor			>6 >4 (ASR-3400HF)	>4	>6	>3
	Line Regulation			0.2%	---	0.1%	0.1%
	Load Regulation		%	0.5%	---	0.2%	0.5%
DC Output	Output Capacity		VA	2000 / 3000 / 4000	1500 / 3000 / 4500	750 / 1000 / 2000	750 / 1500 / 2250
	Output Range		V	285 / 570	220 / 440	212 / 424	212 / 424
	Output Current	Low	A	20 / 30 / 40	15 / 30 / 40	6 / 8 / 16	6 / 12 / 18
		High	A	10 / 15 / 20	7.5 / 15 / 20	3 / 4 / 8	3 / 6 / 9
Setting	Voltage	Resolution	V	0.1	0.1	0.1	0.01
		Accuracy	V	± (1% of set + 1 V / 2 V)	± (1% of set + 0.6 V / 1.2 V)	0.2% + 0.2% F.S.	± 0.2% + (0.2%+0.2%×Kfreq)×FS
	Frequency	Resolution	Hz	0.01 / 0.1	0.1	0.01 / 0.1	---
		Accuracy	Hz	± 0.02% of setting	± 0.01% of setting	0.15%	---
	ON Phase	Resolution	°	1°	0.1°	0.1°	1°
	OFF Phase	Resolution	°	---	0.1°	0.1°	1°
Measurement	Voltage (rms)	Resolution	V	0.1	0.1	0.1	0.01
		Accuracy	V	±(0.5 % of reading + 0.5 V / 1 V) @DC, 45 - 65Hz ±(0.7 % of reading + 1 V / 2 V) @all other frequencies	±(0.5 % of reading + 0.3 V / 0.6 V) @DC, 45 - 65Hz ±(0.7 % of reading + 0.9 V / 1.8 V) @all other frequencies	0.2% + 0.2% F.S.	0.2% + 0.2% F.S.
	Voltage (peak)	Resolution	V	0.1	0.1	---	---
		Accuracy	V	±(|2 % of reading| + 1 V/2 V) @DC, 45 - 65Hz	±(|2 % of reading| + 1 V/2 V) @DC, 45 - 65Hz	---	---
	Current (rms)	Resolution	A	0.01	0.01	0.01	0.01

		Accuracy	A	±(0.5 % of reading+0.1 A/0.05 A) @DC, 45 - 65Hz *3 ±(0.7 % of reading+0.2 A/0.1 A) @all other frequencies *3	±(0.5 % of reading+0.04 A/0.04 A) @DC, 45 - 65Hz *3 ±(0.7 % of reading+0.04 A/0.04 A) @all other frequencies *3	0.4% + 0.3% F.S.	± 0.3% + (0.3%+0.2%×Kfreq)×FS *3
	Current (peak)	Resolution	A	0.1	0.01	0.1	0.01
		Accuracy	A	±(|2 % of reading| + 0.5 A/0.25 A) @DC, 45 - 65Hz *3	±(|2 % of reading| + 0.2 A/0.2 A) @DC, 45 - 65Hz *3	0.4% + 0.6% F.S.	± 0.3% + (0.3%+0.2%×Kfreq)×FS *3
	Power	Resolution	W	1	0.1 / 1	0.1	0.01
		Accuracy	W	±(2 % of reading +2 W) *3	±(1 % of reading + 1.5 W) @DC, 45 - 65Hz *3	0.4% + 0.4% F.S.	± 0.4% + (0.4%+0.2%×Kfreq)×FS *3
	Apparent Power	Resolution	VA	1	0.1 / 1	0.1	0.01
		Accuracy	VA	±(2 % of reading +2 VA) *3	±(2 % of reading + 3 VA) @45 - 65Hz *3	---	---
	Reactive Power	Resolution	VAR	1	0.1 / 1	0.1	0.01
		Accuracy	VAR	±(2 % of reading +2 var) *3	±(2 % of reading + 3 var) @45 - 65Hz *3	---	---
	Harmonic voltage Effective value (rms) Percent (%) (AC-INT and 50/60 Hz only)	Resolution		0.1 V, 0.01%	---	---	---
		Accuracy		Up to 20th ±(0.2 % of reading+0.5 V/1 V) *3 20th to 100th ±(0.3 % of reading+0.5 V/1 V) *3	---	---	---
	Harmonic current Effective value (rms) Percent (%)	Resolution		0.01 A, 0.1%	0.01 A, 0.1%	---	---
		Accuracy		Up to 20th ±(1 % of reading+0.4 A/0.2 A) *3 20th to 100th ±(1.5 % of reading+0.4 A/0.2 A) *3	Up to 20th ±(1 % of reading+0.2 A/0.2 A) *3 20th to 40th ±(1.5 % of reading+0.2 A/0.2 A) *3	---	---
	ON / OFF Phase			V	V	V	V
	Sequence / Simulate Mode			V	V (opt.)	X	X
	LIST / PULSE / STEP / HAR / SYNC INTERHAR			X	X	V	V
	Programmable Output Impedance			X	X	V	V
	Parallel Mode			X	V	V	V
	Three Phase Mode			X	V	V	V
	T Ipeak, Hold Function			V	V	X	X
	Power ON Output Status Function			V	V	V	V
	Number of Sequence or List Mode			10	10	99	---
	Steps Number of Each Sequence			999 max. (for 1 sequence)	255 max. (for 1 sequence)	---	---
	Preset Settings			V	X	X	X
	Output Relay Control			V	V	X	V
	Voltage Harmonic Analysis			V	X	X	X
	Current Harmonic Analysis			V	V	V	V
Front Panel	USB Host			V	V	X	V
Front Panel	Display			4.3'' LCD	LCD	LCD	7'' LCD (Touch Panel)
Front Panel	Output Socket	Universal		V	V	X	V
Front Panel	Output Socket	Euro Type		V	X	X	X
Rear Panel	External Reference			X	V	V	V
Rear Panel	TTL Signal			X	X	V	V
Rear Panel	VCA			V	V (opt.)	X	V
Rear Panel	SYNC			V	V	X	V

	EXT, ADD			V	V (opt.)	X	X
	Remote Sense			V	V	V	V
Interface	LAN			V (std.)	X	X	V (std.)
	USB Device			V (std.)	V (std.)	X	V (std.)
	RS-232C			V (std.)	V (std.)	V (opt.)	V (std.)
	RS-485			X	X	X	X
	GPIB			V (std.)	V (opt.)	V (opt.)	V (std.)
	CAN			X	X	X	V (std.)
Protection	UVP / OCP / OPP / OTP			V	V	V	V
	Line Voltage Detect			V	V	V	V
	FAN Fail			V	V	V	V
General	CE Mark			V	V	V	V
	Operating Temperature		℃	0 ~ +40	0 ~ +50	0 ~ +40	0 ~ +40
	Storage Temperature		℃	-10 ~ +70	-10 ~ +60	-40 ~ +85	-10 ~ +70
	Operating Humidity (no condensation)		%	20 ~ 80% RH	5 ~ 85% RH	30 ~ 90% RH	20 ~ 80% RH
	Storage Humidity (no condensation)		%	80% RH or less	5 ~ 95% RH	---	---
	Dimensions (W × H × D)	1500VA	mm	---	430 × 398 × 562	483 × 134 × 570	430 × 151 × 719
		2000VA	mm	430 × 176 × 550	---	483 × 134 × 570	---
		3000VA	mm	430 × 176 × 550	430 × 398 × 562	---	484 × 347 × 706
		4000VA	mm	430 × 176 × 550	---	483 × 267 × 570	---
		4500VA	mm	---	430 × 665 × 562	---	550 × 907 × 840
	Weight	1500VA	kg	---	38	20	---
		2000VA	kg	25	---	20	---
		3000VA	kg	25	50	---	100
		4000VA	kg	25	---	41	---
		4500VA	kg	---	70	---	---

*1: Chroma 61505

*2: ITECH IT7625

*3: The specifications are the difference by model

V: Support / X: No support / ---: without indication

Specifications

SPECIFICATIONS					
		ASR-3200	ASR-3300	ASR-3400	ASR-3400HF
INPUT RATING (AC)					
NOMINAL INPUT VOLTAGE		200 Vac to 240 Vac			
INPUT VOLTAGE RANGE		180 Vac to 264 Vac			
PHASE		Single phase, Two-wire			
NOMINAL INPUT FREQUENCY		50 Hz to 60 Hz			
INPUT FREQUENCY RANGE		47 Hz to 63 Hz			
MAX. POWER CONSUMPTION		2500 VA or less	3750 VA or less	5000 VA or less	5000 VA or less
POWER FACTOR[*1]	**200Vac**	0.95 (TYP)			
MAX. INPUT CURRENT	**200Vac**	15 A	22.5 A	30 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	40 A
	200 V	10 A	15 A	20 A	20 A
MAXIMUM PEAK CURRENT[*4]	**100 V**	120 A	180 A	240 A	160 A
	200 V	60 A	90 A	120 A	80 A
LOAD POWER FACTOR		0 to 1 (leading phase or lagging phase)			
POWER CAPACITY		2000 VA	3000 VA	4000 VA	4000 VA
FREQUENCY	**Setting range**	AC Mode: 40.0 Hz to 999.9 Hz, AC+DC Mode: 1 Hz to 999.9 Hz			AC Mode: 40.0 Hz to 5000 Hz, AC+DC Mode: 1 Hz to 5000 Hz
	Setting resolution	0.01 Hz (1.00 to 99.99 Hz), 0.1 Hz (100.0 to 999.9 Hz)			0.01 Hz (1.00 to 99.99 Hz), 0.1 Hz (100.0 to 999.9 Hz) 1 Hz (1000 to 5000 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	40 A
	200 V	10 A	15 A	20 A	20 A
MAXIMUM PEAK CURRENT[*4]	**100 V**	120 A	180 A	240 A	160 A
	200 V	60 A	90 A	120 A	80 A
POWER CAPACITY		2000 W	3000 W	4000 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		< 0.2% @50/60Hz < 0.5% @<500Hz < 1.0% @500.1Hz~2000Hz < 2.0% @2001Hz~5000Hz
OUTPUT VOLTAGE RESPONSE TIME[*2]			100 µs (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		
		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		
		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		
		Accuracy[*5]	±(2 % of reading +2 W)	±(2 % of reading +3 W)	±(2 % of reading +4 W)
	Apparent (VA)	**Resolution**	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		
		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		
		Resolution	0.001		
LOAD CREST FACTOR		**Range**	0.00 to 50.00		
		Resolution	0.01		
HARMONIC VOLTAGE **EFFECTIVE VALUE (RMS)** **PERCENT (%)** **(AC-INT and 50/60 Hz only)**		**Range**	Up to 100th order of the fundamental wave		
		Full Scale	200 V / 400 V, 100%		
		Resolution	0.1 V, 0.1%		
		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)		
HARMONIC CURRENT **EFFECTIVE VALUE (RMS)** **PERCENT (%)** **(AC-INT and 50/60 Hz only)**		**Range**	Up to 100th order of the fundamental wave		
		Full Scale	20 A / 10 A, 100%	30 A / 15 A, 100%	40 A / 20 A, 100%
		Resolution	0.01 A, 0.1%		
		Accuracy[*3]	Up to 20th ±(1 % of reading+0.4 A/0.2 A) 20th to 100th ±(1.5 % of reading+0.4 A/0.2 A)	Up to 20th ±(1 % of reading+0.6 A/0.3 A) 20th to 100th ±(1.5 % of reading+0.6 A/0.3 A)	Up to 20th ±(1 % of reading+0.8 A/0.4 A) 20th to 100th ±(1.5 % of reading+0.8 A/0.4 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 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 % 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)×530(D) mm (not including protrusions); Approx. 25kg

A value with the accuracy is the guaranteed value of the specification. However, an accuracy noted as reference value shows the supplemental data for reference when the product is used, and is not under the guarantee. A value without the accuracy is the nominal value or representative value (shown as typ.).

Should you have any questions on the ASR-3400HF announcement, please don’ t hesitate to contact us.

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