Multi-phase Programmable AC/DC Power Source

ASR-6000 Parallel Models Series

USER MANUAL

Rev. B

ISO-9001 CERTIFIED MANUFACTURER

GW INSTEK

The information in this manual was correct at the time of printing. However, Good Will continues to improve products and reserves the rights to change specification, equipment, and maintenance procedures at any time without notice.

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SAFETY INSTRUCTIONS

This chapter contains important safety instructions that you must follow during operation and storage. Read the following before any operation to ensure your safety and to keep the instrument in the best possible condition.

Safety Symbols

These safety symbols may appear in this manual or on the instrument.

 WARNING	Warning: Identifies conditions or practices that could result in injury or loss of life.
 CAUTION	Caution: Identifies conditions or practices that could result in damage to the ASR-6000 or to other properties.
	DANGER High Voltage
	Attention Refer to the Manual
	Protective Conductor Terminal
	Earth (ground) Terminal

Do not dispose electronic equipment as unsorted municipal waste. Please use a separate collection facility or contact the supplier from which this instrument was purchased.

Safety Guidelines

General Guideline

Do not place any heavy object on the ASR-6000.

CAUTION

Avoid severe impact or rough handling that leads to damaging the ASR-6000.

Do not discharge static electricity to the ASR-6000.

Use only mating connectors, not bare wires, for the terminals.

Do not block the cooling fan opening.

Do not disassemble the ASR-6000 unless you are qualified.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

Power Supply ⚠ WARNING	AC Input voltage range: 200 to 240 Vac ± 10% (3P3W) 380 to 415 Vac ± 10% (3P4W) Frequency: 47 ~ 63 Hz To avoid electrical shock connect the protective grounding conductor of the AC power cord to an earth ground. The power switch that is included in the instrument is not considered a disconnecting device. The permanently connected power input is used as the disconnecting device and shall remain readily operable. a. A switch or circuit-breaker must be included in the installation b. It must be suitably located and easily reached c. It must be marked as the disconnecting device for the equipment. d. It shall be located near the equipment Do not position the equipment so that it is difficult to operate the disconnecting device. Ask for professional technician for installation. The ASR-6000 model shall be employed in rack-based applications and it shall not be connected to external cord directly. In addition, installation shall be done by a qualified person in accordance with local regulations. The ASR-6000 model is not to be used in standalone scenario.
Cleaning the ASR-6000	Disconnect the circuit-breaker or permanently connected power input before cleaning. Use a soft cloth dampened in a solution of mild detergent and water. Do not spray any liquid. Do not use chemicals containing harsh material such as benzene, toluene, xylene, and acetone.

Operation Environment	Location: Indoor, no direct sunlight, dust free, almost non-conductive pollution (Note below) Relative Humidity: 20%~ 80%, no condensation Altitude: < 2000m Temperature: 0°C to 40°C (Pollution Degree) EN 61010-1:2010 specifies the pollution degrees and their requirements as follows. The ASR-6000 falls under degree 2. Pollution refers to "addition of foreign matter, solid, liquid, or gaseous (ionized gases), that may produce a reduction of dielectric strength or surface resistivity". Pollution degree 1: No pollution or only dry, non-conductive pollution occurs. The pollution has no influence. Pollution degree 2: Normally only non-conductive pollution occurs. Occasionally, however, a temporary conductivity caused by condensation must be expected. Pollution degree 3: Conductive pollution occurs, or dry, non-conductive pollution occurs which becomes conductive due to condensation which is expected. In such conditions, equipment is normally protected against exposure to direct sunlight, precipitation, and full wind pressure, but neither temperature nor humidity is controlled.
Storage environment	Location: Indoor Temperature: -10°C to 70°C Relative Humidity: ≤90%, no condensation
Disposal 	Do not dispose this instrument as unsorted municipal waste. Please use a separate collection facility or contact the supplier from which this instrument was purchased. Please make sure discarded electrical waste is properly recycled to reduce environmental impact.

GETTING STARTED

This chapter describes the ASR-6000 parallel model series in a nutshell, including its main features, operating area, accessories and front with rear panel introduction.

ASR-6000 Parallel Model Series in 15u

ASR-6000 Parallel Model Series in 19u

ASR-6000 Parallel Model Series in 23u

ASR-6000 Parallel Models Series Overview

Series lineup

The ASR-6000 parallel models series consists of 5 models, which differ in various capacity. Note that throughout the user manual, the term "ASR-6000" refers to any of the models, unless stated otherwise.

1P Output Condition

Model Name	Power Rating	Max. Output Current	Max. Output Voltage
ASR-6450-09	9000 VA	90 / 45 A	350 Vrms / 500 Vdc
ASR-6600-12	12000 VA	120 / 60 A	350 Vrms / 500 Vdc
ASR-6450-13.5	13500 VA	135 / 67.5 A	350 Vrms / 500 Vdc
ASR-6600-18	18000 VA	180 / 90 A	350 Vrms / 500 Vdc
ASR-6600-24	24000 VA	240 / 120 A	350 Vrms / 500 Vdc

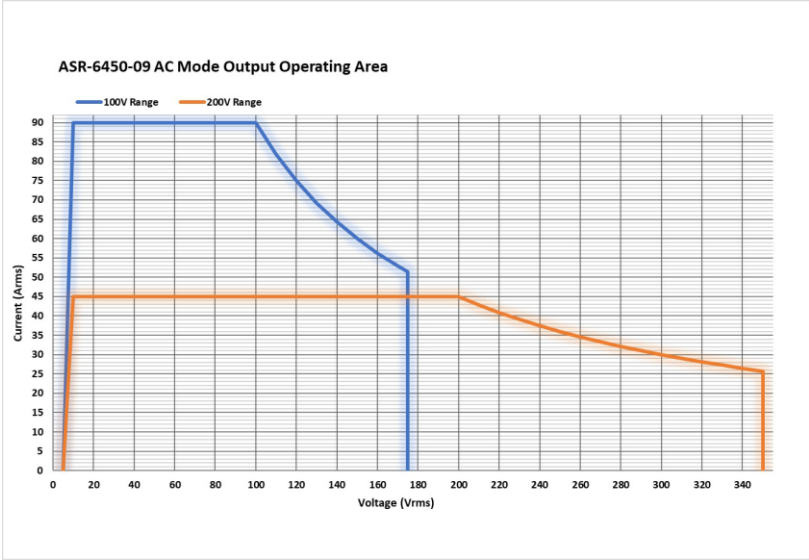
1P3W Output Condition

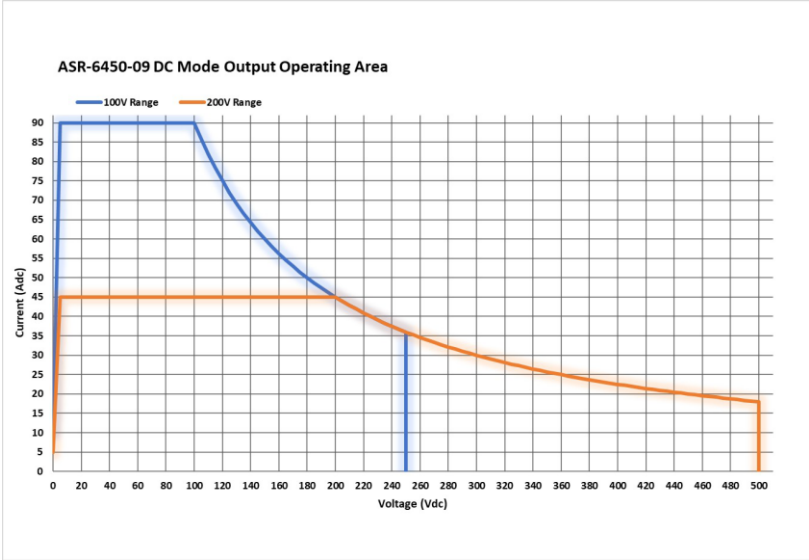
Model Name	Power Rating	Max. Output Current	Max. Output Voltage
ASR-6450-09	6000 VA	30 / 15 A	700 Vrms / 1000 Vdc
ASR-6600-12	8000 VA	40 / 20 A	700 Vrms / 1000 Vdc
ASR-6450-13.5	9000 VA	45 / 22.5 A	700 Vrms / 1000 Vdc
ASR-6600-18	12000 VA	60 / 30 A	700 Vrms / 1000 Vdc
ASR-6600-24	16000 VA	80 / 40 A	700 Vrms / 1000 Vdc

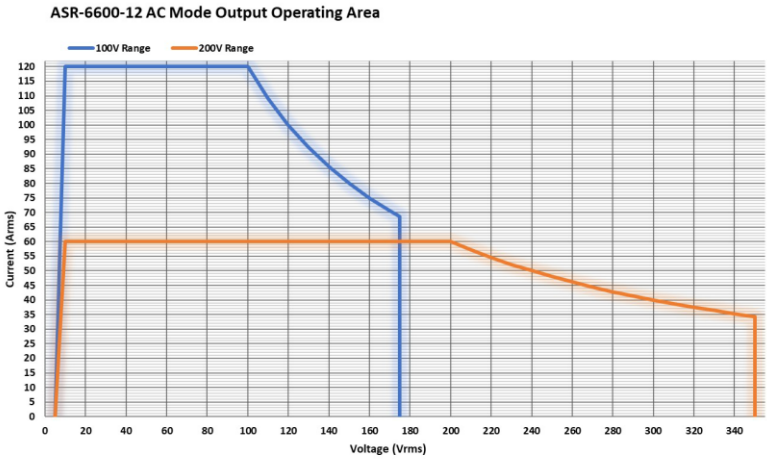
3P Output Condition (Pre phase)

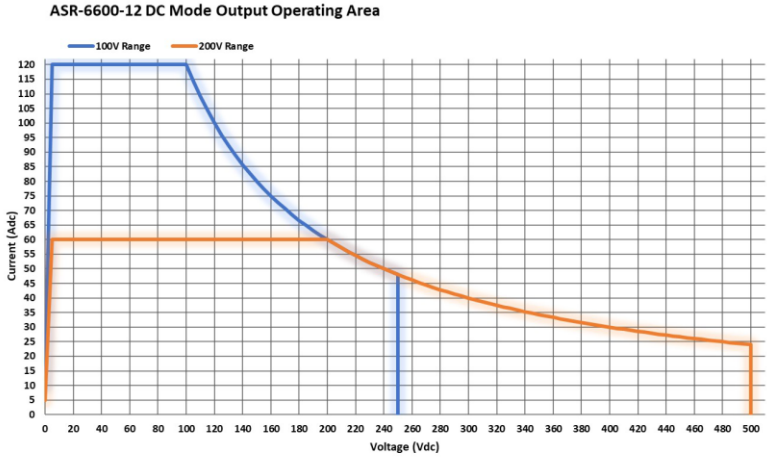
Model Name	Power Rating	Max. Output Current	Max. Output Voltage
ASR-6450-09	3000 VA	30 / 15 A	350 Vrms / 500 Vdc
ASR-6600-12	4000 VA	40 / 20 A	350 Vrms / 500 Vdc
ASR-6450-13.5	4500 VA	45 / 22.5 A	350 Vrms / 500 Vdc
ASR-6600-18	6000 VA	60 / 30 A	350 Vrms / 500 Vdc
ASR-6600-24	8000 VA	80 / 40 A	350 Vrms / 500 Vdc

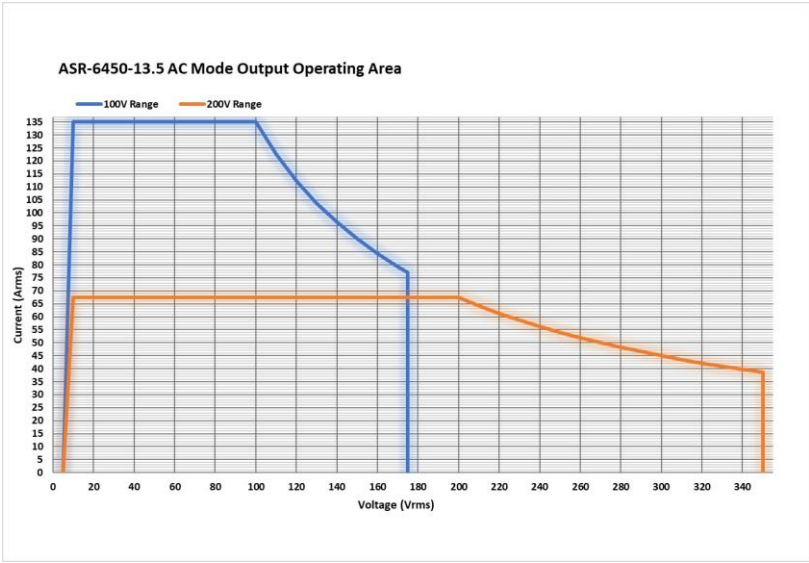
Operating Area

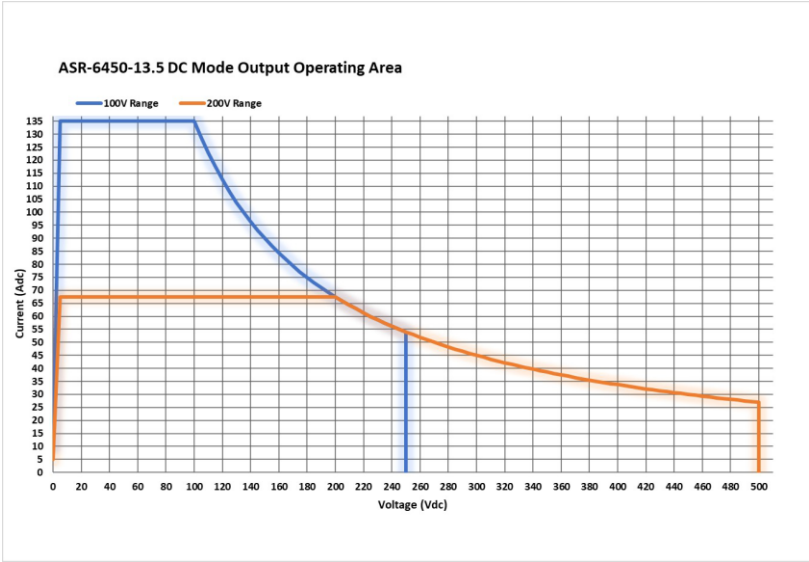


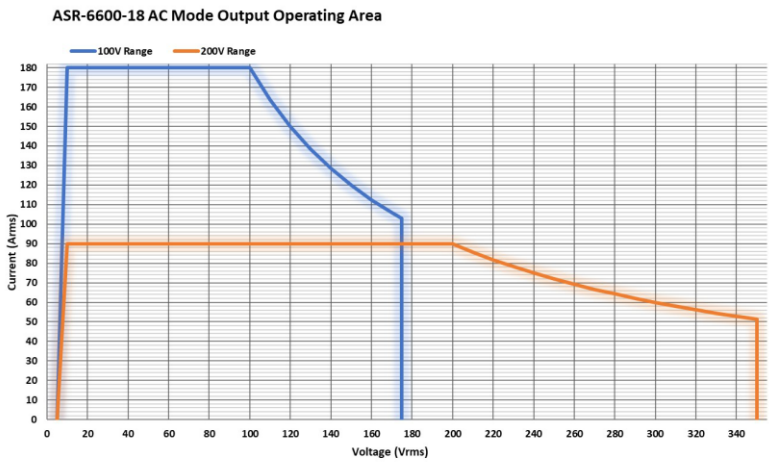


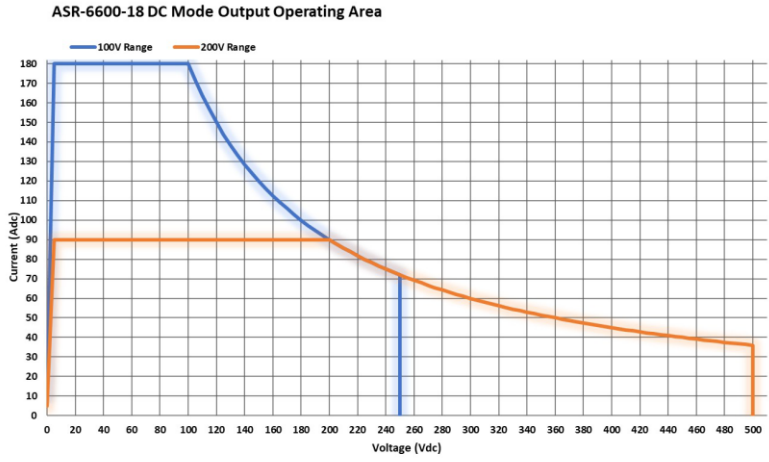

ASR-6600-12 AC Mode Output Operating Area
100V Range
200V Range
Current (Arms)
Voltage (Vrms)


ASR-6600-12 DC Mode Output Operating Area
100V Range
200V Range
Current (Adc)
Voltage (Vdc)

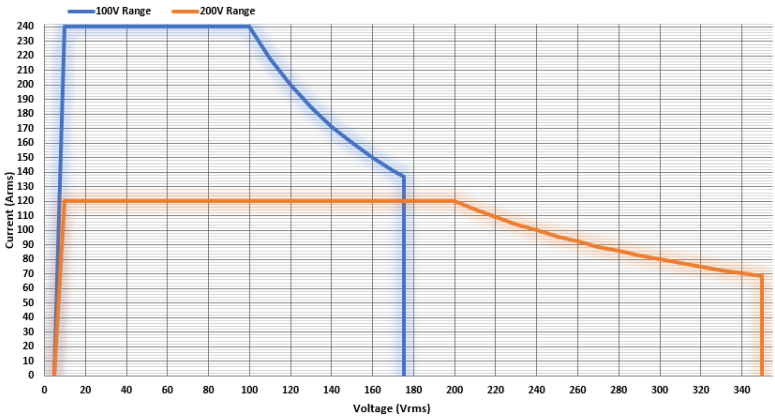

ASR-6450-13.5 AC Mode Output Operating Area
100V Range
200V Range
Current (Arms)
Voltage (Vrms)


ASR-6450-13.5 DC Mode Output Operating Area
100V Range
200V Range
Current (Adc)
Voltage (Vdc)

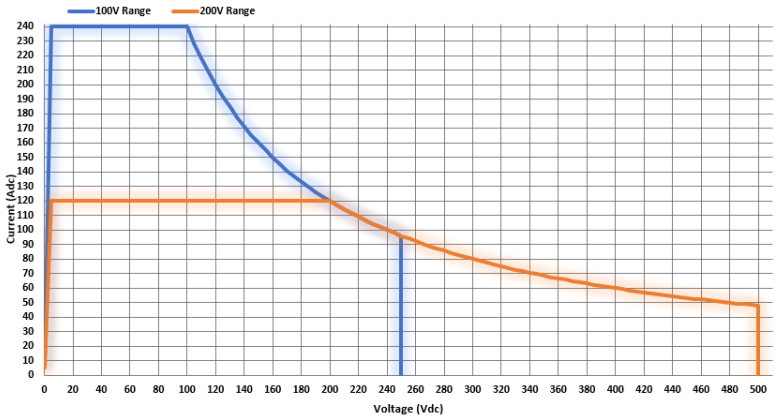

ASR-6600-18 AC Mode Output Operating Area
100V Range
200V Range
Current (Arms)
Voltage (Vrms)


ASR-6600-18 DC Mode Output Operating Area
100V Range
200V Range
Current (Adc)
Voltage (Vdc)

ASR-6600-24 AC Mode Output Operating Area



ASR-6600-24 DC Mode Output Operating Area



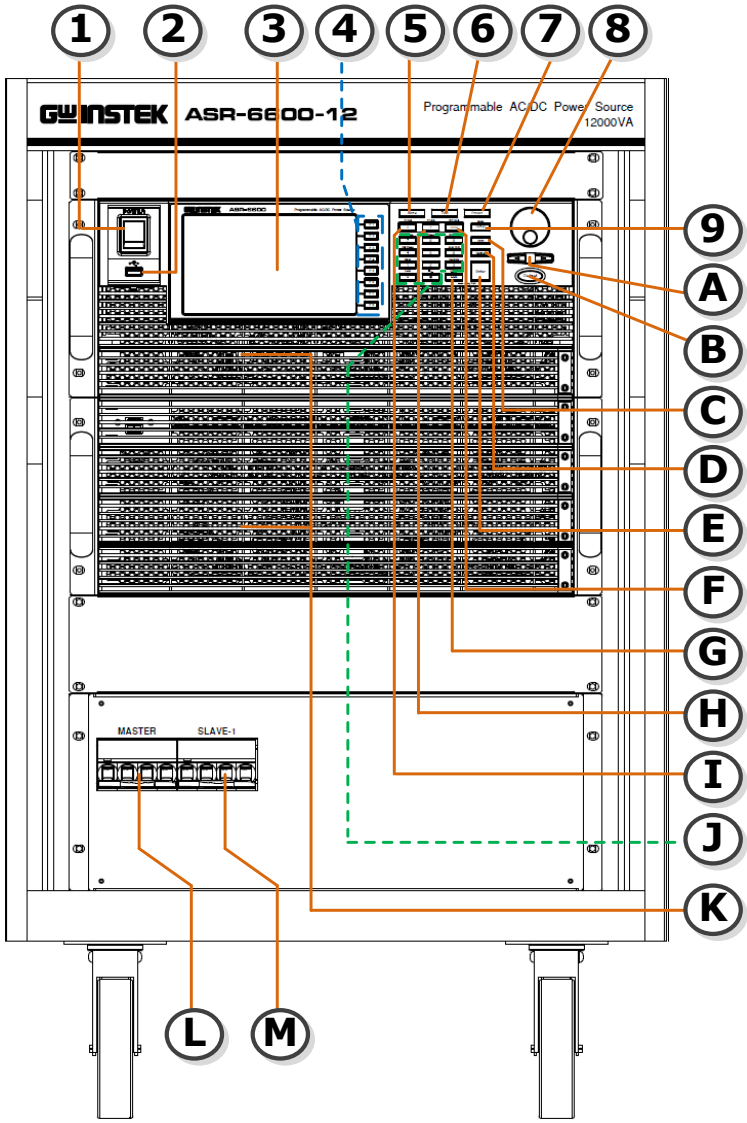
Accessories

Before using the ASR-6000 parallel models, check the package contents to make sure all the standard accessories are included.

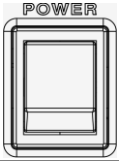
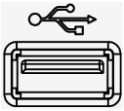
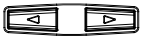
Standard Accessories	Part number	Description
	82GW1SAFE0M*1	Safety guide
	62SR-6KDSC201 62SR-6KDSC301	Input terminal cover
	62SR-6KDSC501 62SR-6KDSC601	Output terminal cover
	GTL-246	USB cable (USB 2.0 Type A - Type B cable, approx. 1.2M)
Optional Accessories	**Part number**	**Description**
	GTL-232	RS232C cable, approx. 2M
	GTL-248	GPIB cable, approx. 2M
	ASR-003	GPIB interface card
	ASR-004	DeviceNet interface card
	ASR-005	CAN BUS interface card

Appearance

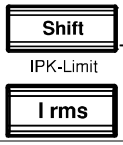
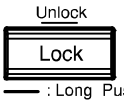
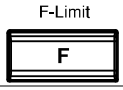
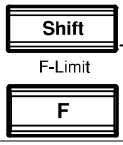
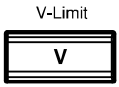
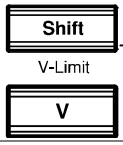
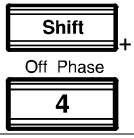
Front Panel

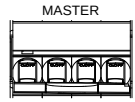
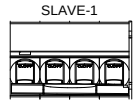


Item Index	Description
1	Power switch button
2	USB interface connector (A Type)
3	LCD screen
4	Function keys (blue zone)
5	Menu key
6	Test key
7	Preset key
8	Scroll wheel
9	Range key/Output mode key
A	Arrow keys
B	Output key
C	Shift key
D	Cancel key
E	Enter key
F	Irms/IPK-Limit button
G	Lock/Unlock button
H	F/F-Limit button
I	V/V-Limit button
J	Numerical Keypad with additional “Shift + key” shortcut functions (green zone)
K	Air inlets
L	Master Circuit Breaker
M	Slave Circuit Breaker

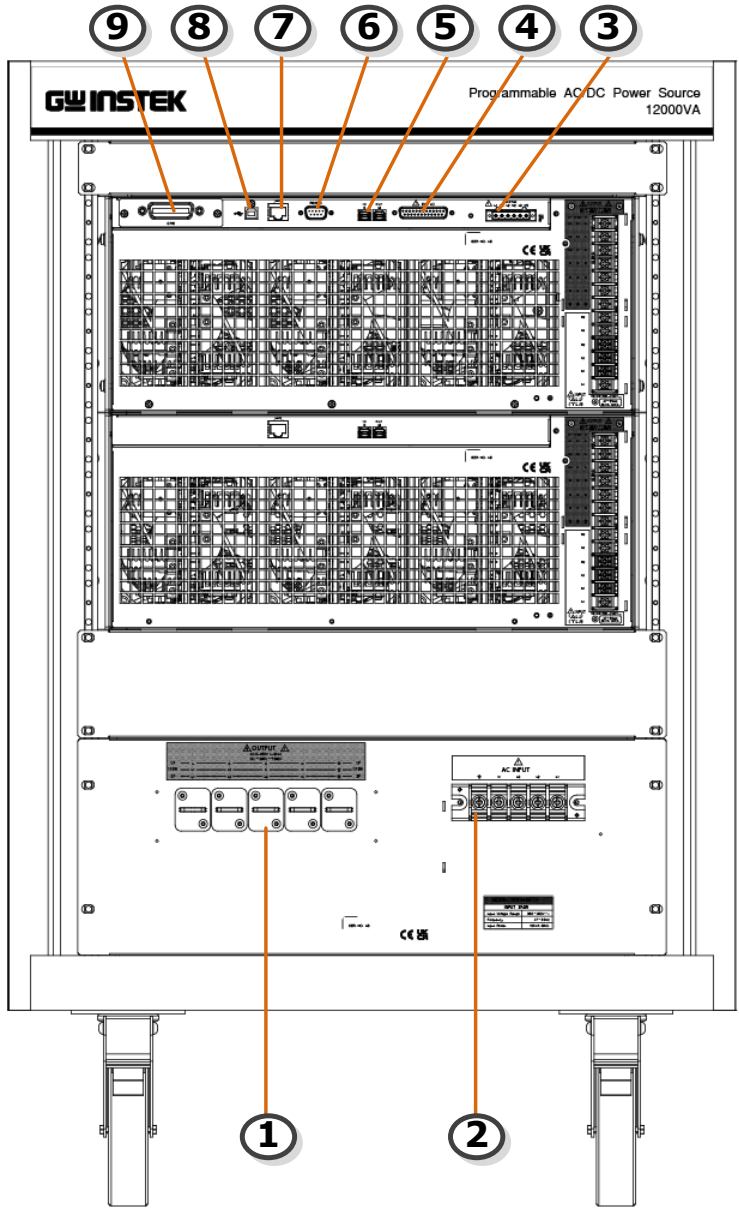
Item	Description
Power Switch	 Turn on the mains power
USB A Port	 The USB port is used for data transfers and upgrading software. Also, it is available for screenshot hardcopy. It supports FAT32 format with maximum 32G storage.
LCD Screen	Displays the setting and measured values or menu system
Function Keys	 Assigned to the functions displayed on the right side of the screen.
Menu Key	 Enters the Main menu or goes back to one of the display modes.
Test Key	 Puts the instrument into the Sequence and Simulation control mode.
Preset Key	 Puts the instrument into Preset mode.
Arrow Keys	 The arrow keys are used to select the digit power of a value that is being edited.

Range Key	Mode Range	Switches between the 100V, 200V and AUTO ranges
Output Mode	Shift + Mode Range	Selects between the AC+DC-INT, AC-INT, DC-INT, AC+DC-EXT, AC-EXT, AC+DC-ADD, AC-ADD, AC+DC-Sync, AC-Sync and AC-VCA modes.
Scroll Wheel		Used to navigate menu items or for increment/decrement values one step at a time.
Output Key	Output	Turns the output on or off.
Shift Key	Shift	Turns on the shift state, which enables shortcut operations with an icon Shift indicated on the top status bar. The shift state, which allows continuous shortcut operations, is kept until another press on shift key again. ⚠ When performing shortcut operations, press shift key followed by another shortcut function key. Do Not press both shift key and shortcut function key simultaneously.
Cancel Key	Cancel	Used to cancel function setting menus or dialogs.
Enter Key	Enter	Confirms selections and settings.
Irms	IPK-Limit I rms	Used for setting the maximum output current.

IPK-Limit		Used to set the peak output current limit value.
Lock/Unlock Key		Used to lock or unlock the front panel keys except output key. Simply press to lock, whilst long press to unlock.
F		Used for setting the output frequency (DC mode N/A).
F-Limit		Used for setting the output frequency limit value (DC mode N/A).
V		Used for setting the output voltage.
V-Limit		Used for setting the output voltage limit value.
Keypad		Used to input power of a value directly. The +/- . key is used to input decimal / plus or minus.
On Phase		Sets the on phase for the output voltage.
Off Phase		Sets the off phase for the output voltage.

Output Waveform	Shift + Wave 1	Selects between the Sine, Square, Triangle and ARB 1~253 waveforms (not available for DC-INT, AC+DC-EXT and AC-EXT).
Local Mode	Shift + Local 0	Switches operation back to local mode from remote mode.
IPK CLR	Shift + IPK CLR 9	Used to clear peak output current value.
ALM CLR	Shift + ALM CLR 6	Clears alarms.
Hardcopy Key	Shift + Hardcopy 3	Used to take a screenshot. Make sure an USB flash disk in well inserted before the action.
Output Phase	Shift + Phase 8	Used to prompt the output phase window where 1P2W, 1P3W and 3P4W modes are available for selection.
Master Circuit Breaker		Input power circuit breaker of ASR-6000 Master unit
Slave Circuit Breaker		Input power circuit breaker of ASR-6000 Slave unit

Rear Panel


9
8
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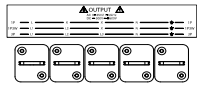
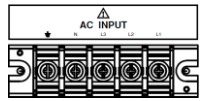
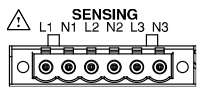
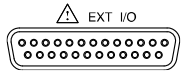
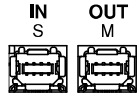
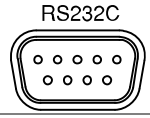
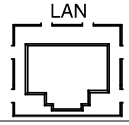
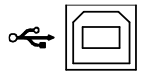
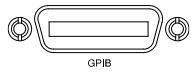
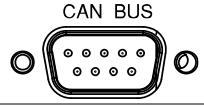
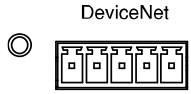
6
5
4
3
GW INSTEK
Programmable AC/DC Power Source
12000VA
OUTPUT
AC INPUT
1
2

Item Index	Description
1	Output terminal
2	AC power input terminal
3	Remote sensing input terminal
4	External I/O connector
5	External IN/OUT connection in parallel function
6	RS232 connector
7	Ethernet (LAN) connector
8	USB interface connector (B Type)
9	Optional interface Slot ▪ GPIB card (ASR-003) ▪ DeviceNet card (ASR-004) ▪ CAN BUS card (ASR-005)

Item	Description	
Output Terminal		Output terminal (M8 screw nut and M3 screw)
AC Power Input Terminal		AC inlet (depend on models) (M5 screw type, 2 ~ 14 AWG, screw torque value: 2 ~ 2.5 N·m) (M8 screw type, 2/0 ~ 10 AWG, screw torque value: 3.5 ~ 6 N.m)
Remote Sensing Input Terminal		Remote sensing input terminal is for compensation of load wire voltage drop. (M2.5 screw type, 12 ~ 30 AWG, screw torque value: 0.5N*m, strip length: 7 ~ 8mm)

External Control I/O Connector		Used to control ASR-6000 externally by using the logic signal and monitor Sequence function status.
External IN/OUT Connection in Parallel Function		The IN (Slave) and OUT (Master) ports are used for connection with external unit in parallel function.
RS232C Connector		The RS232C connector for controlling the ASR-6000 remotely.
Ethernet LAN Port		The Ethernet port is used for remote control.
USB B-type Port		USB port for controlling the ASR-6000 remotely.
Optional GPIB Connector		The optional GPIB connector for controlling the ASR-6000 remotely.
Optional CAN BUS Connector		The optional CAN BUS connector for controlling the ASR-6000 remotely.
Optional DeviceNet Connector		The optional DeviceNet connector for controlling the ASR-6000 remotely.

OPERATION

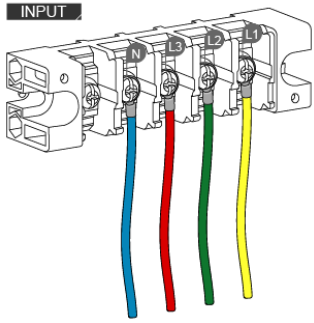
Set Up

We take the illustration of 3P4W Input Connection here for example. Please refer to page 28 of the Input Terminal Connection chapter for the detailed information covering the 2 different connection methods.

Power Up and Procedure

Connect the AC power cords to the AC input terminals.

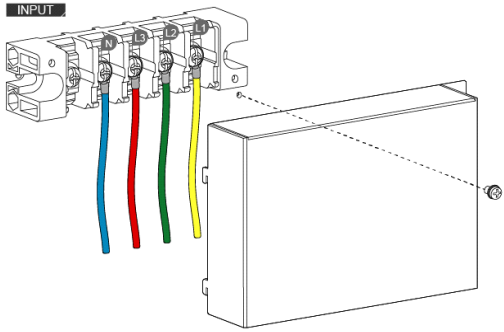
- ✓ Red → L3
- ✓ Green → L2
- ✓ Yellow → L1
- ✓ Blue → Neutral



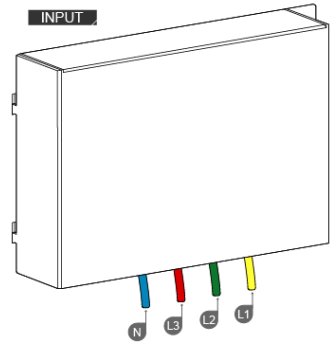
Note

- Power input cords are not included in this product.
- The input & output terminals necessitate connectivity through ring-type connectors.

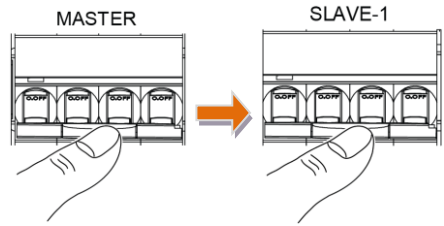
Install the protective lid of power input terminals followed by fastening the single screw to fix the lid firmly into place.



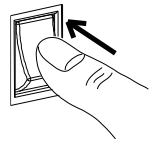
The AC power cords of 3P4W input are connected with the AC input terminals equipped with protective lid completely.



Turn ON circuit breakers in the sequence of MASTER followed by SLAVE. In the case of multiple SLAVE units in parallel connection, turn ON each circuit breaker of SLAVE in proper sequence, e.g., SLAVE-1 -> SLAVE-2, and so forth.



Press the *POWER* key. The welcome screen of GWINSTEK will be displayed followed by self-checking procedure before the continuous mode screen appears with the settings loaded.



⚠ CAUTION	▪ If the warning message of “Parallel Communication Error” appears in the screen display, turn Off both *POWER* key and circuit breakers followed by repeating the appropriate power up procedure above. ▪ Contact local dealer in your region if the warning message of “Parallel Communication Error” can Not be solved after repeating the power up procedure. ▪ The power supply takes around 35 seconds to fully turn on and shutdown. ▪ Do not turn the power on and off quickly, otherwise the unit will be damaged due to insufficient time for self-checking procedure. It is recommended to observe an interval of at least 10 seconds between power on and off.

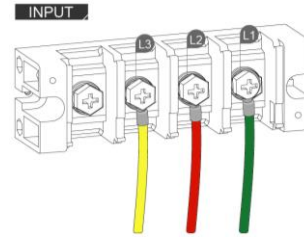
Input Terminal Connection

Background	Basically, the input terminal, which is located in the rear panel of unit, can be connected through 2 methods: 3P4W and 3P3W connections. Depending on varied input methods, use the corresponding power cords for connection. Refer to the following chapters for details of each connection.

Input Terminal 3P3W Connection

Connect the AC power cords to the AC input terminals.

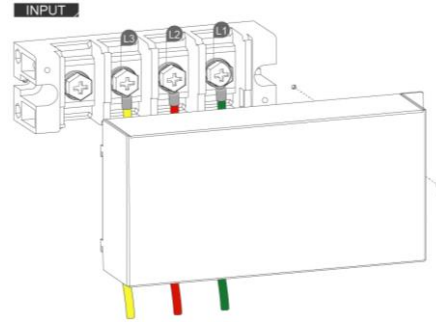
- ✓ Red → L2
- ✓ Green → L1
- ✓ Yellow → L3



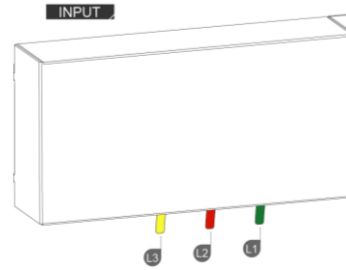
Note

- Power input cords are not included in this product.
- The input & output terminals necessitate connectivity through ring-type connectors.

Install the protective lid of power input terminals followed by fastening the single screw to fix the lid firmly into place.



The AC power cords of 3P3W input are connected with the AC input terminals equipped with protective lid completely.



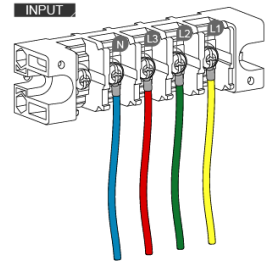
WARNING

The diagram is only for reference on wiring method. Please proceed to wiring in accordance with the color definitions in your local country.

Input Terminal 3P4W Connection

Connect the AC power cords to the AC input terminals.

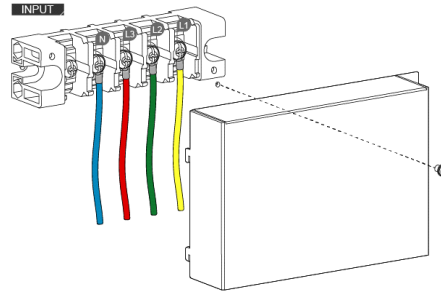
- ✓ Red → L3
- ✓ Green → L2
- ✓ Yellow → L1
- ✓ Blue → Neutral



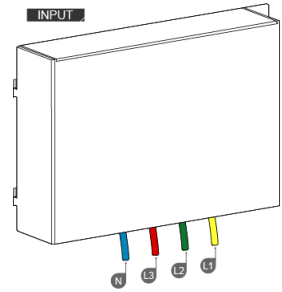
Note

- Power input cords are not included in this product.
- The input & output terminals necessitate connectivity through ring-type connectors.

Install the protective lid of power input terminals followed by fastening the single screw to fix the lid firmly into place.



The AC power cords of 3P4W input are connected with the AC input terminals equipped with protective lid completely.



WARNING

The diagram is only for reference on wiring method. Please proceed to wiring in accordance with the color definitions in your local country.

Output Terminal Connection

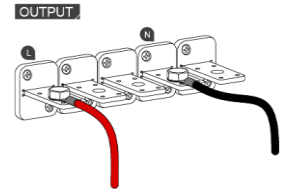
Background	The output terminal can output power in three modes: 1P2W, 1P3W and 3P4W. Select applicable output mode, via panel configurations, in accordance with varied applications.
⚠ WARNING	Be aware of dangerous voltages. Ensure that the power to the instrument is disabled before handling the power supply output terminals. Failing to do so may lead to electric shock.
⚠ CAUTION	After configuring phase settings via the front panel, please make sure the cords connection on the rear panel is corresponding to the set configuration.

1P2W Output Connection

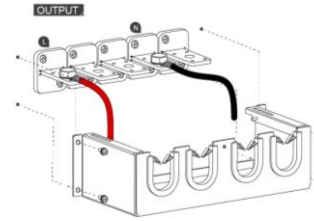
Disconnect the ASR unit from the mains power socket and turn the power switch off before wires connection.

Connect the output wires to the AC output terminals as follows:

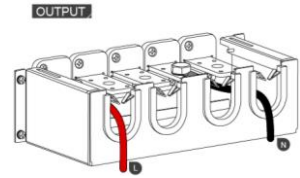
- ✓ Red → Line (L)
- ✓ Black → Neutral (N)



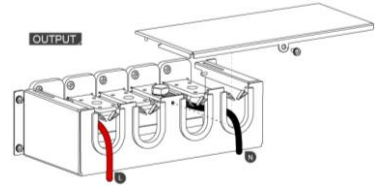
Install the protective cover of power output terminals followed by fastening the 4 screws to fix the protective cover firmly into place.



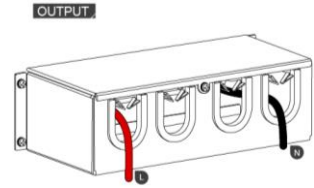
The protective cover of power output terminals is well installed and fixed on the rear panel.



Install the protective lid of power output terminals followed by fastening the single screw to fix the lid firmly into place.



The AC power cords of 1P2W output are connected with the AC output terminals equipped with protective cover and lid completely.



Note

- The input & output terminals necessitate connectivity through ring-type connectors.
- Grounded Neutral Output for 1P2W output only: ASR-6000 allows for a grounded return on the neutral output. It is suit for the medical industry that required between ground with neutral is 0 V essentially. And possible to mitigate ground loops that is ideal for reduce ground noise and isolate sensitive equipment from the effects of ground loops.

WARNING

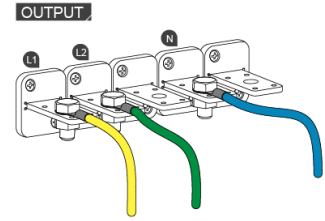
Because the neutral has been referenced to the chassis ground, be careful electric shock by yourself.

1P3W Output Connection

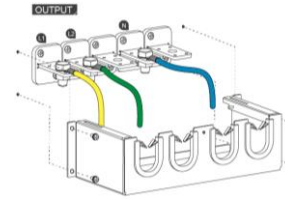
Disconnect the ASR unit from the mains power socket and turn the power switch off before wires connection.

Connect the output wires to the AC output terminals as follows:

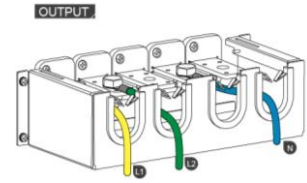
- ✓ Yellow → Line (L1)
- ✓ Green → Line (L2)
- ✓ Blue → Neutral (N)



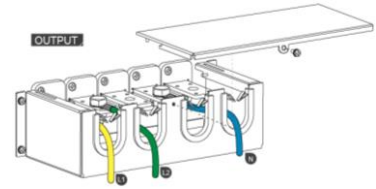
Install the protective cover of power output terminals followed by fastening the 4 screws to fix the protective cover firmly into place.



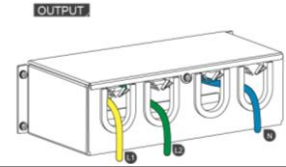
The protective cover of power output terminals is well installed and fixed on the rear panel.



Install the protective lid of power output terminals followed by fastening the single screw to fix the lid firmly into place.



The AC power cords of 1P3W output are connected with the AC output terminals equipped with protective cover and lid completely.



Note

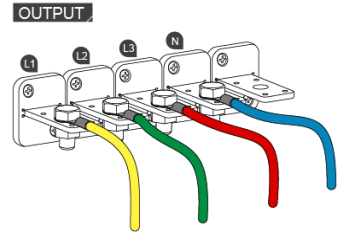
- The input & output terminals necessitate connectivity through ring-type connectors.

3P4W Output Connection

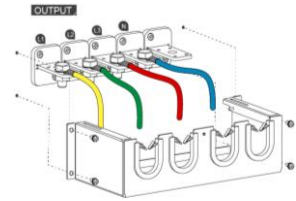
Disconnect the ASR unit from the mains power socket and turn the power switch off before wires connection.

Connect the output wires to the AC output terminals as follows:

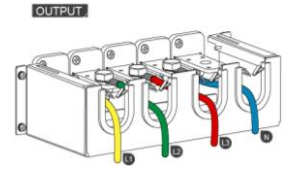
- ✓ Yellow → Line (L1)
- ✓ Green → Line (L2)
- ✓ Red → Line (L3)
- ✓ Blue → Neutral (N)



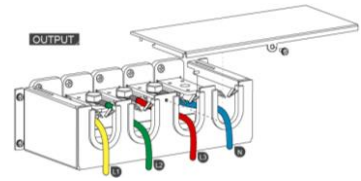
Install the protective cover of power output terminals followed by fastening the 4 screws to fix the protective cover firmly into place.



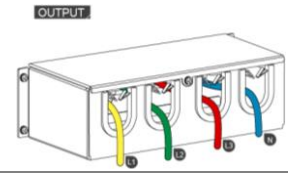
The protective cover of power output terminals is well installed and fixed on the rear panel.



Install the protective lid of power output terminals followed by fastening the single screw to fix the lid firmly into place.



The AC power cords of 3P4W output are connected with the AC output terminals equipped with protective cover and lid completely.



Note	▪ The input & output terminals necessitate connectivity through ring-type connectors.
WARNING	The diagram is only for reference on wiring method. Please proceed to wiring in accordance with the color definitions in your local country.

Remote Sensing, EXT I/O and Interface Connection

Remote Sensing	Remote sense is used to compensate for the voltage drop seen across load cables due to resistance inherent in the load cables. The remote sense function can compensate a maximum of 5% of the output voltage and all of output frequency. Based on different 3 output methods, the connections of remote sense vary accordingly. Refer to the following chapters of remote sense connections for each power output method.
WARNING	Dangerous voltages. Ensure that the power to the instrument is disabled before handling the power supply output terminals. Failing to do so may lead to electric shock.
Note	To minimize noise pickup or radiation, the load wires and remote sense wires should be twisted-pairs of the shortest possible length. Shielding of the sense leads may be necessary in high noise environments. Where shielding is used, connect the shield to the chassis via the rear panel ground screw. Even if noise is not a concern, the load and remote sense wires should be twisted-pairs to reduce coupling, which might impact the stability of the power supply. The sense leads should be separated from the power leads.
EXT I/O & Interface	Since EXT I/O & Interface connections relate to several types and connectors, refer to User Manual of ASR-6000 for more details when necessary.

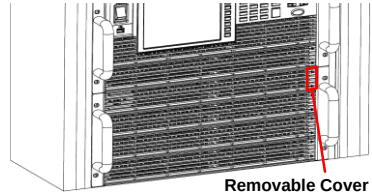
APPENDIX

Firmware Update

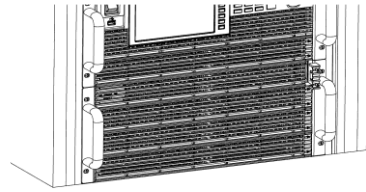
Background	The ASR series firmware can be upgraded using the USB A-type port on the front panel. See your local distributor or the GWINSTEK website for the latest firmware information.
⚠ Note	• Both Master and Slave ASR units are required to be plugged in USB flash drives with the identical firmware version in order to complete update process simultaneously. • To be free from unexpected erroneous issues, please prepare, for example, 4 USB flash drives for 1 Master and 3 Slave units in parallel connection. DO NOT update partial ASR units, e.g., only update Master but without Slave units. • Ensure the DUT is not connected. • Ensure the output is surely off.

Steps

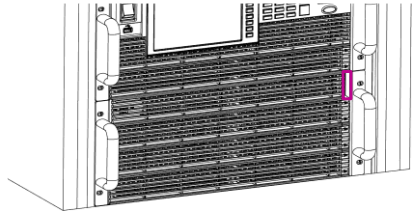
1. Since the USB A-type port is hidden within a plastic frame in Slave unit, please identify the removable cover in the right-side corner of front panel as the figure shown below.



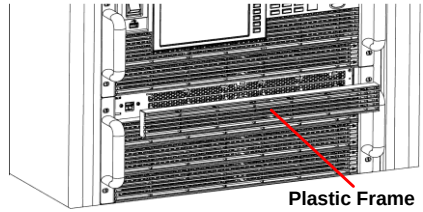
2. Loosen the two screws on the removable cover.



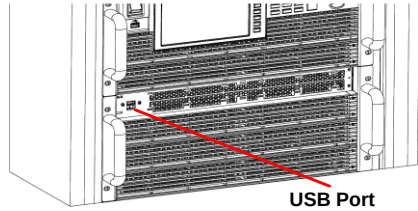
3. The removable cover is removed accordingly.



4. Pull out the plastic frame from ASR Slave unit.



5. The plastic frame was removed and thus the USB A-type port of Slave unit appears.

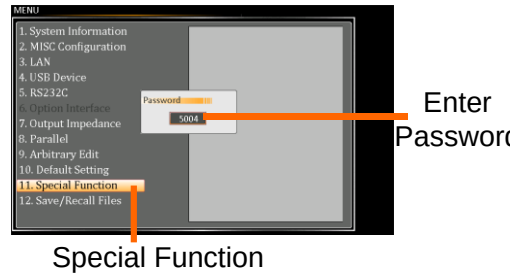


6. Repeat the previous step 1 to step 5 for each connected ASR Slave unit.

7. Insert USB flash drives into the USB A-type ports on front panel of both Master and Slave units. The USB drives should include the **gw_sb6.upg** file in a directory name "gw"(USB\gw:).

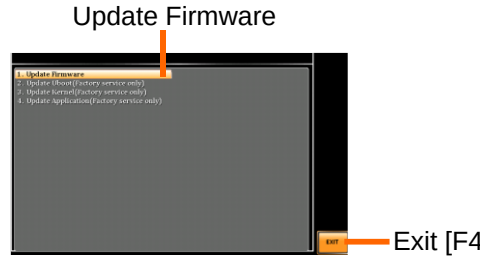
8. Press the *Menu* key on the Master unit. and the Menu setting will appear on the display of Master unit.

9. Use the scroll wheel to go to item 11, *Special Function* and press *Enter*.



10. Key in the password when prompted and then press *Enter*. The password is "5004".

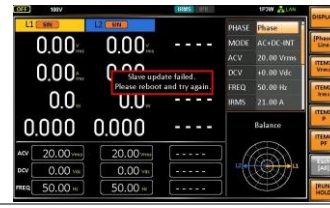
11. Go to Item 1, *Update Firmware* and press *Enter*.



12. Wait for the units to update. Upon completion the units will automatically reboot.

Note

If the following case occurs during update process as the diagram below, it indicates failure of update and please thus contact GWINSTEK or your local dealer.



Function Difference Table

A Comparison between Stand Alone Type and Parallel Type

The difference functions			
Item	**Description**	**Stand Alone Type**	**Parallel Type**
1	V Response	Fast, Medium(default), Slow	Medium(default), Slow
2	Output Impedance Setting	O	X
3	External Parallel Operation	2 to 4 units flexible	Fixed
4	Output Frequency	2 kHz	550 Hz or 1 kHz (Depend on model)

Factory Default Settings

The following default settings are the factory configuration settings for the ASR-6000 series. For details on how to return to the factory default settings, refer to the User Manual of ASR-6000.

Continuous Mode	ASR-6450-09		ASR-6600-12		ASR-6450-13.5		ASR-6600-18		ASR-6600-24	
	3P4W	1P2W	3P4W	1P2W	3P4W	1P2W	3P4W	1P2W	3P4W	1P2W
MODE	AC+DC-INT Mode									
Range	100V									
ACV	0.00 Vrms									
DCV	+0.00 Vdc									
FREQ	50.00 Hz									
IRMS	30.00 A	90.00 A	40.00 A	120.0 A	45.00 A	135.0 A	60.00 A	180.0 A	80.00 A	240.0 A
ON Phs	Fixed 0.0°									
OFF Phs	Fixed 0.0°									
Gain	100									
SIG	L1 LINE									
SRC	L1 EXT									
Wave	SIN									
Syc Phs	0									
Freq Limit	2000 Hz									
Vrms Limit	175.0 Vrms									
VPK+ Limit	+ 250 V									
VPK- Limit	- 250 V									
IPK+ Limit	+120.0 A	+360.0 A	+160.0 A	+480.0 A	+180.0 A	+540.0 A	+240.0 A	+720.0 A	+320.0 A	+960.0 A
IPK- Limit	-120.0 A	-360.0 A	-160.0 A	-480.0 A	-180.0 A	-540.0 A	-240.0 A	-720.0 A	-320.0 A	-960.0 A

MISC Configuration	ASR-6450-09	ASR-6600-12	ASR-6450-13.5	ASR-6600-18	ASR-6600-24
T peak, hold(msec)			1		
Phase Mode			Unbalance		
Peak CLR			ALL		
Power ON			OFF		
Buzzer			ON		
Remote Sense			OFF		
V Response			Medium		
Output Relay			Enable		
Measure Unit			RMS		
THD Format			IEC		
External Control I/O			OFF		
V Unit (TRI, ARB)			rms		
Set Change Phase			OFF		
Monitor Output1			L1 Voltage		
Monitor Output2			L1 Current		
Monitor Output Amp			±2.5		
TrgOut Width (ms)			0.1		
TrgOut Source			L1		
Re-Lock			ON		
Data Average Count			8		
Data Update Rate			Fast		

LAN	ASR-6450-09	ASR-6600-12	ASR-6450-13.5	ASR-6600-18	ASR-6600-24
DHCP			ON		

USB Device	ASR-6450-09	ASR-6600-12	ASR-6450-13.5	ASR-6600-18	ASR-6600-24
Speed			Full		
Mode			TMC		

RS232C	ASR-6450-09	ASR-6600-12	ASR-6450-13.5	ASR-6600-18	ASR-6600-24
Baudrate			9600		
Databits			8bits		
Parity			None		
Stopbits			1bit		

GPIB	ASR-6450-09	ASR-6600-12	ASR-6450-13.5	ASR-6600-18	ASR-6600-24
Address			10		

CAN BUS	ASR-6450-09	ASR-6600-12	ASR-6450-13.5	ASR-6600-18	ASR-6600-24
Baudrate			125K		
Node ID			127		

DeviceNet	ASR-6450-09	ASR-6600-12	ASR-6450-13.5	ASR-6600-18	ASR-6600-24
Baudrate			125K		
MAC ID			63		

Sequence Mode	ASR-6450-09	ASR-6600-12	ASR-6450-13.5	ASR-6600-18	ASR-6600-24
Step			0		
Time			0.1000 S		
Jump to			OFF		
Jump Cnt			1		
Branch1			OFF		
Branch2			OFF		
Term			CONTI		
Sync Code			LL		
Item	L1 L2 L3	L1 L2 L3	L1 L2 L3	L1 L2 L3	L1 L2 L3
ACV	0.00,CT 0.00,CT 0.00,CT	0.00,CT 0.00,CT 0.00,CT	0.00,CT 0.00,CT 0.00,CT	0.00,CT 0.00,CT 0.00,CT	0.00,CT 0.00,CT 0.00,CT
DCV	0.00, CT 0.00,CT 0.00,CT	0.00, CT 0.00,CT 0.00,CT	0.00, CT 0.00,CT 0.00,CT	0.00, CT 0.00,CT 0.00,CT	0.00, CT 0.00,CT 0.00,CT
Fset	50.0,CT 50.0,CT 50.0,CT	50.0,CT 50.0,CT 50.0,CT	50.0,CT 50.0,CT 50.0,CT	50.0,CT 50.0,CT 50.0,CT	50.0,CT 50.0,CT 50.0,CT
Wave			SIN		
Trig Out			LO		
ON Phs			Free		
OFF Phs			Free		
Phase	Fixed(0) 120 240	Fixed(0) 120 240	Fixed(0) 120 240	Fixed(0) 120 240	Fixed(0) 120 240

Sequence Mode	ASR-6450-09	ASR-6600-12	ASR-6450-13.5	ASR-6600-18	ASR-6600-24
Step			Initial		
Repeat			OFF		
Time			0.1000 S		
Term			Free		
Code			LL		
Item	L1 L2 L3	L1 L2 L3	L1 L2 L3	L1 L2 L3	L1 L2 L3
ACV	0.00	0.00	0.00	0.00	0.00
Fset	50.00	50.00	50.00	50.00	50.00
Wave			SIN		
ON Phs			Free		
OFF Phs			Free		

Error Messages & Messages

The following error messages or messages may appear on the ASR-6000 screen display during varied operations.

Normal Messages	Description	Protection type
Keys Locked	All of keys are locked, except output key, long push “Lock” to disable Keys Locked	Display Message Only
Keys Unlocked	All of keys are unlocked	Display Message Only
Invalid with Remote Control	All of keys are locked, except Output and Shift and Local Key, press "Shift + 0" to disable Remote Control	Display Message Only
Invalid with Remote Lock Control	All of keys including Output and Local Keys are locked.	Display Message Only
Invalid in This Meter Frozen	Invalid Operation In This Meter Frozen, press "F8" to disable Meter Frozen	Display Message Only
Invalid in This Page	Invalid Operation In This Page. Valid main and simple page for preset mode.	Display Message Only
Recalled From M#	Recalled Preset From M0 ~ M9	Display Message Only
Saved To M#	Saved Preset To M0 ~ M9	Display Message Only
Setting Voltage Limited	Setting voltage be limited, press "shift + V" to check allowance set range	Display Message Only
Setting Frequency Limited	Setting frequency be limited, press "shift + F" to check allowance set range	Display Message Only
Setting Phase Limited	Setting ON/OFF Phase Limited	Display Message Only
Setting Duty Limited	Setting Duty be limited	Display Message Only
Invalid with Output ON	Invalid with Output ON	Display Message Only

Rear USB Port Connected To PC	Rear USB port connected to PC	Display Message Only
Rear USB Port Disconnected From PC	Rear USB port disconnected from PC	Display Message Only
Reseting...	Ready For Recall Factory Default	Display Message Only
Failed Factory Default	Recall Factory Default Failed	Display Message Only
Error Password	Input Error Password	Display Message Only
USB Memory Unconnected	Could not detect USB memory, please connect a USB memory.	Display Message Only
No File ([Filename]) in [directory]	Not find specific file in USB specific directory	Display Message Only
Saved to DEF1	Saved Setting to DEF1	Display Message Only
Saved to DEF2	Saved Setting to DEF2	Display Message Only
Preset Mode	Operation at preset mode	Display Message Only
Exit Preset Mode	Exit preset mode	Display Message Only
Meter Frozen	Operation at Meter Frozen mode, all measure value will stop update.	Display Message Only
Only AC-INT and 50/60Hz Active	Harmonic Page Limit Message	Display Message Only
Configure Phase Toggle,Please wait...	Configure Phase Toggle	Display Message Only
[Filename] Saved Success	Save file to USB success message. [Filename] ex Preset0.Set or SEQ0.SEQ or SIM0.SIM or ARB1.ARB	Display Message Only
[Filename] Saved Fail	Save file to USB fail message	Display Message Only
[Filename] Recalled Success	Recalled file success message	Display Message Only
[Filename] Recall Fail(No File in [directory])	Recall file fail message(not find specific file in USB specific directory)	Display Message Only
[Filename] Recall Fail(File Format Error)	Recall file fail message(file format error)	Display Message Only

[Filename] Recall Fail(File Data Error)	Recall file fail message(file Data error(Data out of Range))	Display Message Only
Preset M# Deleted	Preset M0~M9 Deleted	Display Message Only
ARB# Deleted	ARB1~ARB253 Deleted	Display Message Only
Save All Data	Ready to save all data (Preset0~9 + SEQ0~9 + SIM0~9 + ARB1~253)	Display Message Only
All Data Saved Success	All data are saved successfully (Preset0~9 + SEQ0~9 + SIM0~9 + ARB1~253)	Display Message Only
Recall All Data	Ready to recall all data (Preset0~9 + SEQ0~9 + SIM0~9 + ARB1~253)	Display Message Only
All Data Recall Success	All data are recalled successfully (Preset0~9 + SEQ0~9 + SIM0~9 + ARB1~253)	Display Message Only
Delete All Data	Ready to delete all data (Preset0~9 + SEQ0~9 + SIM0~9 + ARB1~253)	Display Message Only
All Data Deleted	All data are deleted successfully (Preset0~9 + SEQ0~9 + SIM0~9 + ARB1~253)	Display Message Only
USB Memory Connected	Detect USB Memory connected	Display Message Only
USB Memory Access Error	Please check a FAT32-formatted USB memory, and Reinsert USB memory	Display Message Only
USB File Write Error!	Can not Save File to USB	Display Message Only
Screen Saved to USB:/GWDIMC###.bmp	Screenshot be saved to USB memory successful	Display Message Only
Hardcopy Fail!(Too Many Files in USB)	Hardcopy Fail !, Over 1000 files in USB	Display Message Only
Valid Only AC-INT, DC-INT and AC-Sync Mode		Display Message Only
Valid Only 100V and 200V Range	Remote Sense Setting Limit Message	Display Message Only
Valid Only SIN Wave Shape		Display Message Only

Saved To ARB#	Saved to ARB1 ~ ARB253	Display Message Only
Saved To ARB#,V-Limit Invalid	Saved to ARB1 ~ ARB253,V-Limit Invalid	Display Message Only
Saved To ARB#,V-Limit & Freq Invalid	Saved to ARB1 ~ ARB253,V-Limit and Freq Invalid	Display Message Only
Saved To ARB Fail	Failed to save ARB file, please check whether the file is correct	Display Message Only
Invalid in This Output Mode	This mode not support SEQ or SIM Valid Only AC+DC-INT, AC-INT and DC-INT Mode for SEQ Valid Only AC+DC-INT Mode for SIM	Display Message Only
Invalid For Auto Range	Auto range not allow SEQ/SIM, change the output range	Display Message Only
Invalid with Output OFF, Turn ON the Output First	The output offstate does not allow the execution, turn on the output first	Display Message Only
Invalid with Output ON, Turn OFF the Output First	The output onstate does not allow the execution, turn off the output first	Display Message Only
Invalid in This Sequence	Invalid Operation In This Sequence	Display Message Only
Invalid in This Simulate	Invalid Operation In This Simulate	Display Message Only
SEQ#Deleted	SEQ0~SEQ9 Deleted	Display Message Only
SIM#Deleted	SIM0~SIM9 Deleted	Display Message Only
Cleared SEQ#	Cleared SEQ0~SEQ9	Display Message Only
Cleared SIM#	Cleared SIM0~SIM9	Display Message Only
Recalled from SEQ#	Recalled fromSEQ0 ~ SEQ9	Display Message Only
Recalled from SIM#	Recalled fromSIM0 ~ SIM9	Display Message Only
Recall Fail!/Recall Data Fail!	SEQ0 ~ SEQ9or SIM0 ~ SIM9Recall Fail!	Display Message Only
Saved to SEQ#	Saved toSEQ0 ~ SEQ9	Display Message Only

Saved to SIM#	Saved toSIM0 ~ SIM9	Display Message Only
Save Fail!	SEQ0 ~ SEQ9 or SIM0 ~ SIM9 save fail!	Display Message Only
Sequence preparation...	Sequence preparation, please wait some time	Display Message Only
Sequence is ready.	Sequence is ready.	Display Message Only
Simulation preparation...	Simulation preparation, please wait some time	Display Message Only
Simulation is ready.	Simulation is ready.	Display Message Only
Alarm Clear Please Wait...	Alarm Clear Please Wait...	Display Message Only
Master Wait Connecting../Slave Wait Connecting..	Master or slave waits for parallel connection	Display Message Only
Valid Only Standalone	Output Impedance Valid Only Standalone	Display Message Only
CANopen Duplicate Node ID	CANopen Duplicate Node ID	Display Message Only
DeviceNet Duplicate Node ID	DeviceNet Duplicate Node ID	Display Message Only
Parallel Error/Parallel Communication Error (#)	Parallel Communication Error (0~9)	Display Message Only

Specifications

The specifications apply when the ASR-6000 is powered on for at least 30 minutes.

Electrical specifications – ASR-6450-09/ ASR-6600-12

Model		ASR-6450-09		ASR-6600-12	
Input ratings					
Power type		Three-phase Three-wire Delta connection Three-phase Four-wire Y connection			
Voltage range[*1]		200 to 240 Vac ± 10% (Phase Voltage) 380 to 415 Vac ± 10% (Line Voltage)			
Frequency range		47 Hz to 63 Hz			
Power factor[*2]		0.95 or higher (typ.)			
Efficiency[*2]		80 % or higher			
Maximum power consumption		12 kVA or lower		16 kVA or lower	
Model		**ASR-6450-09**		**ASR-6600-12**	
AC output					
Multi-phase output		Single-phase output	Polyphase output	Single-phase output	Polyphase output
Output capacity		9 kVA	1P3W: 6 kVA 3P4W: 9 kVA	12 kVA	1P3W: 8 kVA 3P4W: 12 kVA
Mode		1P2W	1P3W 3P4W (Y-connection)	1P2W	1P3W 3P4W (Y-connection)
Setting mode[*3]		---	Unbalance, Balance	---	Unbalance, Balance
Phase voltage	Setting Range[*4]	0.00 V to 175.0 V / 0.0 V to 350.0 V (sine and square wave), Setting Resolution: 0.01 V / 0.1 V			
		0.00 Vpp to 500.0 Vpp / 0.00 Vpp to 1000 Vpp (triangle and arbitrary wave), Setting Resolution: 0.01 Vpp / 0.1 Vpp / 1 Vpp			
	Accuracy[*5]	±(0.3 % of set + 0.5 V / 1 V)			

Line voltage setting range[*6]			1P3W: 0.00 V to 350.0 V / 0.00 V to 700.0 V 3P4W: 0.00 V to 303.1 V / 0.00 V to 606.2 V (sine wave only) Setting Resolution: 0.01 V / 0.1 V		1P3W: 0.00 V to 350.0 V / 0.00 V to 700.0 V 3P4W: 0.00 V to 303.1 V / 0.00 V to 606.2 V (sine wave only) Setting Resolution: 0.01 V / 0.1 V
Maximum current[*7]		90 A / 45 A	30 A / 15 A	120 A / 60 A	40 A / 20 A
Maximum peak current[*8]		Four times of the maximum RMS current			
Load power factor[*9]		0 to 1 (leading phase or lagging phase, 45 Hz to 65Hz)			
Frequency	Setting range	AC Mode: 15.00 Hz to 1000.0 Hz, AC+DC Mode: 1.00 Hz to 1000.0 Hz, Setting resolution: 0.01 Hz / 0.1 Hz			
	Accuracy	± 0.01% of set			
	Stability[*10]	± 0.005%			
Output on phase setting range[*11]		0.0° to 359.9° variable (Free / Fix selectable), 0.1° (1 Hz to 500 Hz), 1° (500 Hz to 1000 Hz)			
Output off phase setting range[*11]		0.0° to 359.9° variable (Free / Fix selectable), 0.1° (1 Hz to 500 Hz), 1° (500 Hz to 1000 Hz)			
Setting range of the phase angle[*12]		---	3P4W: L2 phase: 0° to 359.9° L3 phase: 0° to 359.9° Setting Resolution: 0.1°	---	3P4W: L2 phase: 0° to 359.9° L3 phase: 0° to 359.9° Setting Resolution: 0.1°
Phase angle accuracy[*13]			45 Hz to 65 Hz: ±1.0° 15 Hz to 1000 Hz: ±2.0°	---	45 Hz to 65 Hz: ±1.0° 15 Hz to 1000 Hz: ±2.0°
DC offset[*14]		± 20 mV (typ.)			

Model		ASR-6450-09	ASR-6600-12
DC output (only single-phase output)			
Output capacity		9 kW	12 kW
Mode		Floating output, the N terminal can be grounded	
Voltage	Setting Range	-250.0 V to +250.0 V / -500.0 V to +500.0 V, Setting Resolution: 0.01 V / 0.1 V	
	Accuracy[*15]	± (|0.3 % of set| + 0.3 V / 0.6 V)	
Maximum current[*16]		90 A / 45 A	120 A / 60 A
Maximum peak current[*17]		Four times of the maximum current	

Model	ASR-6450-09	ASR-6600-12
Output Stability, Total Harmonic Distortion, Output voltage rising time and Ripple noise		
Line regulation	±0.1% or less (Phase voltage)	
Load regulation*18	±0.5 V / ±1.0 V (phase voltage, 0 to 100%, via output terminal)	
Distortion of Output*19	<0.3 % @1Hz to 100Hz, <0.5 % @100.1 Hz to 500 Hz, <1 % @500.1 Hz to 1000 Hz	
Output voltage response time*20	Medium: 100 μs (typ.) Slow: 300 μs (typ.)	
Ripple noise*21	0.5 Vrms / 1 Vrms (TYP)	

1) Y connection is three-phase, five-wire, Delta connection is three-phase, four-wire. (Accessories will be provided)
2) In the case of AC-INT mode, the rate output voltage, resistance load at maximum output current, 45 Hz to 65 Hz and sine wave output only.
3) Can be only set in 3P4W mode.
4) For phase voltage setting in polyphase output. In balance mode all phase are collectively set and in unbalance mode each phases are individually set.
5) For an output voltage of 10 V to 175 V / 20 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. For phase voltage setting in the polyphase output.
6) Line voltage only can be set in balance mode.
7) If the output voltage is higher than rated value, this is limited to satisfy the power capacity. If there is the DC superimposition, the active current of AC+DC satisfies the maximum current. In the case of 40 Hz or lower or 400 Hz or higher, and that the ambient temperature is 40 degree or higher, the maximum current may decrease.
8) With respect to the capacitor-input rectifying load. Limited by the maximum current.
9) External power injection or regeneration which is over short reverse power flow capacity is not available.
10) *For 45 Hz to 65 Hz, the rated output voltage, no load and the resistance load for the maximum current, and the operating temperature range.
11) L1, L2 and L3 phase can be set independ at independ mode in the polyphase output.
12) Can be set only with independ mode in polyphase output.
13) For an output voltage of 50V or higher, sine wave, same load and voltage condition for all phase.
14) In the case of the AC mode and output voltage setting to 0 V, 23°C ± 5°C
15) For an output voltage of -250 V to -10 V, +10 V to +250 V / -500 V to -20 V, +20 V to +500 V, no load, AC voltage set to 0V (AC+DC mode) and 23°C ± 5°C
16) If the output voltage is higher than rated value, this is limited to satisfy the power capacity. If there is the AC superimposition, the active current of AC+DC satisfies the maximum current. And the ambient temperature is 40 degree or higher, the maximum current may decrease.
17) Instantaneous within 3 ms, limited by the maximum current at rated output voltage.
18) For an output voltage of 75 V to 175 V / 150 V to 350 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.
19) 50 % or higher of the rated output voltage, the maximum current or lower, AC and AC+DC modes, THD+N. For the polyphase output, it is a specification for phase

voltage setting.

20) 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.
21) For 5 Hz to 1 MHz components in DC mode using the output terminal on the rear panel.

Measured value display
(All accuracy of the measurement function is indicated for 23 °C±5 °C.)

			Single-phase output	Polyphase output[*6]
Voltage[*1*2]	Resolution		0.01 V / 0.1 V	
	RMS value accuracy		45 Hz to 65 Hz and DC: ± (0.5 % of rdg + 0.5 V / 1 V) 15 Hz to 1000 Hz: ± (0.7 % of rdg + 1 V / 2 V)	45 Hz to 65 Hz: ± (0.5 % of rdg + 0.5 V / 1 V) 15 Hz to 1000 Hz: ± (0.7 % of rdg + 1 V / 2 V)
	AVG value accuracy		DC: ± (|0.5 % of rdg| + 0.5 V / 1 V)	DC: ± (|0.5 % of rdg| + 0.5 V / 1 V)
	PEAK value accuracy[*3]		45 Hz to 65 Hz and DC: ± (|2 % of rdg| + 1 V / 2 V)	45 Hz to 65 Hz: ± (|2 % of rdg| + 1 V / 2 V)
Current[*4]	Resolution		0.01 A / 0.1 A	
	RMS value accuracy		45 Hz to 65 Hz and DC: ± (0.5 % of rdg + 0.2 A / 0.1 A) 15 Hz to 1000 Hz: ± (0.7 % of rdg + 0.4 A / 0.2 A)	45 Hz to 65 Hz: ± (0.5 % of rdg + 0.1 A / 0.05 A) 15 Hz to 1000 Hz: ± (0.7 % of rdg + 0.2 A / 0.1 A)
	AVG value accuracy		DC: ± (|0.5 % of rdg| + 0.4 A / 0.2 A)	DC: ± (|0.5 % of rdg| + 0.2 A / 0.1 A)
	PEAK value accuracy[*5]		45 Hz to 65 Hz and DC: ± (|2 % of rdg| + 2 A / 1 A)	45 Hz to 65 Hz: ± (|2 % of rdg| + 1 A / 0.5 A)
Power[*7*8]	Active (W)	Resolution	0.1 W / 1 W / 10 W	
		Accuracy[*9]	± (2 % of rdg + 6 W)	± (2 % of rdg + 2 W)
	Apparent (VA)	Resolution	0.1 VA / 1 VA / 10VA	
		Accuracy	± (2 % of rdg + 9 VA)	± (2 % of rdg + 3 VA)
	Reactive (VAR)	Resolution	0.1 VAR / 1 VAR / 10VAR	
		Accuracy[*10]	± (2 % of rdg + 9 VAR)	± (2 % of rdg + 3 VAR)
Power factor	Range		0.000 to 1.000	
	Resolution		0.001	
Harmonic voltage Effective value (rms) Percent (%) (AC-INT and	Range		Up to 100th order of the fundamental wave	
	Full Scale		200 V / 400 V, 100%	
	Resolution		0.01 V / 0.1 V, 0.1%	
	Accuracy[*12]		Up to 20th: ± (0.2 % of rdg + 0.5 V / 1 V) 21th to 100th: ± (0.3 % of rdg + 0.5 V / 1 V)	

50/60 Hz only) *11			
Harmonic current Effective value (rms) Percent (%) (AC-INT and 50/60 Hz only) *11	Range	Up to 100th order of the fundamental wave	
	Full Scale	126 A / 63 A, 100%	42 A / 21 A, 100%
	Resolution	0.01 A / 0.1 A, 0.1%	
	Accuracy*13	Up to 20th: ± (1 % of rdg + 3 A / 1.5 A) 21th to 100th: ± (1.5 % of rdg + 3 A / 1.5 A)	Up to 20th: ± (1 % of rdg + 1 A / 0.5 A) 21th to 100th: ± (1.5 % of rdg + 1 A / 0.5 A)

1) In the polyphase output, the specification is for phase voltage, and the DC average value display cannot be selected.
2) Accuracy values are in the case that the output voltage is within voltage setting range.
3) The accuracy is for output waveform DC or sine wave only.
4) Accuracy values are in the case that the output current is 5% to 100% of the maximum current.
5) The accuracy is for output waveform DC or sine wave only.
6) In the polyphase output, these are the specifications for each phase.
7) 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.
8) The apparent and reactive powers are not displayed in the DC mode.
9) For the load with the power factor 0.5 or higher.
10) For the load with the power factor 0.5 or lower.
11) The measurement does not conform to the IEC or other standard. Phase Voltage and Phase Current.
12) For an output voltage of 10 V to 175 V / 20 V to 350 V.
13) An output current in the range of 5 % to 100 % of the maximum current.

Model		ASR-6450-09	ASR-6600-12
Others			
Protections		UVP, OVP, OCP, OTP, OPP, Fan Fail, Peak and RMS Current Limit	
Display		TFT-LCD, 7 inches	
Memory function		Store and recall settings, Basic settings: 10	
Arbitrary Wave	Number of memories	253 (nonvolatile)	
	Waveform length	4096 words	
	Amplitude resolution	16 bits	

General Specifications – ASR-6450-09/ ASR-6600-12

Model			ASR-6450-09 ASR-6600-12
Interface	Standard	USB	Type A: Host, Type B: Slave, Speed: 2.0, USB-CDC / USB-TMC
		LAN	MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask
		External	External Signal Input External Control I/O V/I Monitor Output
		RS-232C	Complies with the EIA-RS-232 specifications
	Optional 1	GPIB	SCPI-1993, IEEE 488.2 compliant interface
	Optional 2	CAN Bus	Complies with CAN 2.0A or 2.0B based protocol
	Optional 3	Device Net	Complies with CAN 2.0A or 2.0B based protocol
Insulation resistance	Between input and chassis, output and chassis, input and output		DC 500 V, 30 MΩ or more
Withstand voltage	Between input and chassis, output and chassis, input and output		AC 1500 V or DC 2130 V, 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 (mm)			598(W)×937(H)×906(D) (not including protrusions)
Weight			Approx. 155 kg

- 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.).
- Product specifications are subject to change without notice.

Electrical specifications – ASR-6450-13.5/ASR-6600-18

Model		ASR-6450-13.5		ASR-6600-18	
Input ratings					
Power type		Three-phase Three-wire Delta connection Three-phase Four-wire Y connection			
Voltage range[*1]		200 to 240 Vac ± 10% (Phase Voltage) 380 to 415 Vac ± 10% (Line Voltage)			
Frequency range		47 Hz to 63 Hz			
Power factor[*2]		0.95 or higher (typ.)			
Efficiency[*2]		80 % or higher			
Maximum power consumption		18 kVA or lower		24 kVA or lower	

Model		ASR-6450-13.5		ASR-6600-18	
AC output					
Multi-phase output		Single-phase output	Polyphase output	Single-phase output	Polyphase output
Output capacity		13.5 kVA	1P3W: 9 kVA 3P4W: 13.5 kVA	18 kVA	1P3W: 12 kVA 3P4W: 18 kVA
Mode		1P2W	1P3W 3P4W (Y-connection)	1P2W	1P3W 3P4W (Y-connection)
Setting mode[*3]		---	Unbalance, Balanced	---	Unbalance, Balanced
Phase voltage	Setting Range[*4]	0.00 V to 175.0 V / 0.0 V to 350.0 V (sine and square wave), Setting Resolution: 0.01 V / 0.1 V			
		0.00 Vpp to 500.0 Vpp / 0.00 Vpp to 1000 Vpp (triangle and arbitrary wave), Setting Resolution: 0.01 Vpp / 0.1 Vpp / 1 Vpp			
	Accuracy[*5]	±(0.3 % of set + 0.5 V / 1 V)			
Line voltage setting range[*6]			1P3W: 0.00 V to 350.0 V / 0.00 V to 700.0 V 3P4W: 0.00 V to 303.1 V / 0.00 V to 606.2 V (sine wave only) Setting Resolution: 0.01 V / 0.1 V		1P3W: 0.00 V to 350.0 V / 0.00 V to 700.0 V 3P4W: 0.00 V to 303.1 V / 0.00 V to 606.2 V (sine wave only) Setting Resolution: 0.01 V / 0.1 V
Maximum current[*7]		135 A / 67.5 A	45 A / 22.5 A	180 A / 90 A	60 A / 30 A
Maximum peak current[*8]		Four times of the maximum RMS current			

Load power factor[*9]		0 to 1 (leading phase or lagging phase, 45 Hz to 65Hz)		
Frequency	Setting range	AC Mode: 15.00 Hz to 1000.0 Hz, AC+DC Mode: 1.00 Hz to 1000.0 Hz, Setting resolution: 0.01 Hz / 0.1 Hz		
	Accuracy	± 0.01% of set		
	Stability[*10]	± 0.005%		
Output on phase setting range[*11]		0.0° to 359.9° variable (Free / Fix selectable), 0.1° (1 Hz to 500 Hz), 1° (500 Hz to 1000 Hz)		
Output off phase setting range[*11]		0.0° to 359.9° variable (Free / Fix selectable), 0.1° (1 Hz to 500 Hz), 1° (500 Hz to 1000 Hz)		
Setting range of the phase angle[*12]		---	3P4W: L2 phase: 0° to 359.9° L3 phase: 0° to 359.9° Setting Resolution: 0.1°	---	3P4W: L2 phase: 0° to 359.9° L3 phase: 0° to 359.9° Setting Resolution: 0.1°
Phase angle accuracy[*13]			45 Hz to 65 Hz: ±1.0° 15 Hz to 1000 Hz: ±2.0°	---	45 Hz to 65 Hz: ±1.0° 15 Hz to 1000 Hz: ±2.0°
DC offset[*14]		± 20 mV (typ.)		
Model		ASR-6450-13.5		ASR-6600-18
DC output (only single-phase output)				
Output capacity		13.5 kW		18 kW
Mode		Floating output, the N terminal can be grounded		
Voltage	Setting Range	-250.0 V to +250.0 V / -500.0 V to +500.0 V, Setting Resolution: 0.01 V / 0.1 V		
	Accuracy[*15]	± (|0.3 % of set| + 0.3 V / 0.6 V)		
Maximum current[*16]		135 A / 67.5 A		180 A / 90 A
Maximum peak current[*17]		Four times of the maximum current		
Model		ASR-6450-13.5		ASR-6600-18
Output Stability, Total Harmonic Distortion, Output voltage rising time and Ripple noise				
Line regulation		±0.1% or less (Phase voltage)		
Load regulation[*18]		±0.5 V / ±1.0 V (phase voltage, 0 to 100%, via output terminal)		
Distortion of Output[*19]		<0.3 % @1Hz to 100Hz, <0.5 % @100.1 Hz to 500 Hz, <1 % @500.1 Hz to 1000 Hz		
Output voltage response time[*20]		Medium: 100 µs (typ.) Slow: 300 µs (typ.)		
Ripple noise[*21]		0.5 Vrms / 1 Vrms (TYP)		

1) Y connection is three-phase, five-wire, Delta connection is three-phase, four-wire. (Accessories will be provided)

2) In the case of AC-INT mode, the rate output voltage, resistance load at maximum output current, 45 Hz to 65 Hz and sine wave output only.
3) Can be only set in 3P4W mode.
4) For phase voltage setting in polyphase output. In balance mode all phase are collectively set and in unbalance mode each phases are individually set.
5) For an output voltage of 10 V to 175 V / 20 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. For phase voltage setting in the polyphase output.
6) Line voltage only can be set in balance mode.
7) If the output voltage is higher than rated value, this is limited to satisfy the power capacity. If there is the DC superimposition, the active current of AC+DC satisfies the maximum current. In the case of 40 Hz or lower or 400 Hz or higher, and that the ambient temperature is 40 degree or higher, the maximum current may decrease.
8) With respect to the capacitor-input rectifying load. Limited by the maximum current.
9) External power injection or regeneration which is over short reverse power flow capacity is not available.
10) For 45 Hz to 65 Hz, the rated output voltage, no load and the resistance load for the maximum current, and the operating temperature range.
11) L1, L2 and L3 phase can be set independ at independ mode in the polyphase output.
12) Can be set only with independ mode in polyphase output.
13) For an output voltage of 50V or higher, sine wave, same load and voltage condition for all phase.
14) In the case of the AC mode and output voltage setting to 0 V, 23°C ± 5°C
15) For an output voltage of -250 V to -10 V, +10 V to +250 V / -500 V to -20 V, +20 V to +500 V, no load, AC voltage set to 0V (AC+DC mode) and 23°C ± 5°C
16) If the output voltage is higher than rated value, this is limited to satisfy the power capacity. If there is the AC superimposition, the active current of AC+DC satisfies the maximum current. And the ambient temperature is 40 degree or higher, the maximum current may decrease.
17) Instantaneous within 3 ms, limited by the maximum current at rated output voltage.
18) For an output voltage of 75 V to 175 V / 150 V to 350 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.
19) 50 % or higher of the rated output voltage, the maximum current or lower, AC and AC+DC modes, THD+N. For the polyphase output, it is a specification for phase voltage setting.
20) 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.
21) For 5 Hz to 1 MHz components in DC mode using the output terminal on the rear panel.

Measured value display
(All accuracy of the measurement function is indicated for 23 °C±5 °C.)

		Single-phase output	Polyphase output[*6]
Voltage[*1*2]	Resolution	0.01 V / 0.1 V	
	RMS value accuracy	45 Hz to 65 Hz and DC: ± (0.5 % of rdg + 0.5 V / 1 V)	45 Hz to 65 Hz: ± (0.5 % of rdg + 0.5 V / 1 V)

			15 Hz to 1000 Hz: ± (0.7 % of rdg + 1 V / 2 V)	15 Hz to 1000 Hz: ± (0.7 % of rdg + 1 V / 2 V)
	AVG value accuracy		DC: ± (|0.5 % of rdg| + 0.5 V / 1 V)	DC: ± (|0.5 % of rdg| + 0.5 V / 1 V)
	PEAK value accuracy*3		45 Hz to 65 Hz and DC: ± (|2 % of rdg| + 1 V / 2 V)	45 Hz to 65 Hz: ± (|2 % of rdg| + 1 V / 2 V)
Current*4	Resolution		0.01 A / 0.1 A	
	RMS value accuracy		45 Hz to 65 Hz and DC: ± (0.5 % of rdg + 0.3 A / 0.15 A) 15 Hz to 1000 Hz: ± (0.7 % of rdg + 0.6 A / 0.4 A)	45 Hz to 65 Hz: ± (0.5 % of rdg + 0.15 A / 0.08 A) 15 Hz to 1000 Hz: ± (0.7 % of rdg + 0.3 A / 0.15 A)
	AVG value accuracy		DC: ± (|0.5 % of rdg| + 0.6 A / 0.4 A)	DC: ± (|0.5 % of rdg| + 0.3 A / 0.15 A)
	PEAK value accuracy*5		45 Hz to 65 Hz and DC: ± (|2 % of rdg| + 3 A / 1.5 A)	45 Hz to 65 Hz: ± (|2 % of rdg| + 1.5 A / 0.75 A)
Power*7*8	Active (W)	Resolution	0.1 W / 1 W / 10 W	
		Accuracy*9	± (2 % of rdg + 6 W)	± (2 % of rdg + 2 W)
	Apparent (VA)	Resolution	0.1 VA / 1 VA / 10VA	
		Accuracy	± (2 % of rdg + 9 VA)	± (2 % of rdg + 3 VA)
	Reactive (VAR)	Resolution	0.1 VAR / 1 VAR / 10VAR	
		Accuracy*10	± (2 % of rdg + 9 VAR)	± (2 % of rdg + 3 VAR)
Power factor	Range		0.000 to 1.000	
	Resolution		0.001	
Harmonic voltage Effective value (rms) Percent (%) (AC-INT and 50/60 Hz only) *11	Range		Up to 100th order of the fundamental wave	
	Full Scale		200 V / 400 V, 100%	
	Resolution		0.01 V / 0.1 V, 0.1%	
	Accuracy*12		Up to 20th: ± (0.2 % of rdg + 0.5 V / 1 V) 21th to 100th: ± (0.3 % of rdg + 0.5 V / 1 V)	
Harmonic current Effective value (rms) Percent (%) (AC-INT and 50/60 Hz only) *11	Range		Up to 100th order of the fundamental wave	
	Full Scale		189 A / 94.5 A, 100%	63 A / 31.5 A, 100%
	Resolution		0.01 A / 0.1 A, 0.1%	
	Accuracy*13		Up to 20th: ± (1 % of rdg + 3 A / 1.5 A) 21th to 100th: ± (1.5 % of rdg + 3 A / 1.5 A)	Up to 20th: ± (1 % of rdg + 1 A / 0.5 A) 21th to 100th: ± (1.5 % of rdg + 1 A / 0.5 A)

1) In the polyphase output, the specification is for phase voltage, and the DC average value display cannot be selected.
2) Accuracy values are in the case that the output voltage is within voltage setting

range.

3) The accuracy is for output waveform DC or sine wave only.
4) Accuracy values are in the case that the output current is 5% to 100% of the maximum current.
5) The accuracy is for output waveform DC or sine wave only.
6) In the polyphase output, these are the specifications for each phase.
7) 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.
8) The apparent and reactive powers are not displayed in the DC mode.
9) For the load with the power factor 0.5 or higher.
10) For the load with the power factor 0.5 or lower.
11) The measurement does not conform to the IEC or other standard. Phase Voltage and Phase Current.
12) For an output voltage of 10 V to 175 V / 20 V to 350 V.
13) An output current in the range of 5 % to 100 % of the maximum current.

Model		ASR-6450-13.5	ASR-6600-18
Others			
Protections		UVP, OVP, OCP, OTP, OPP, Fan Fail, Peak and RMS Current Limit	
Display		TFT-LCD, 7 inches	
Memory function		Store and recall settings, Basic settings: 10	
Arbitrary Wave	Number of memories	253 (nonvolatile)	
	Waveform length	4096 words	
	Amplitude resolution	16 bits	

General Specifications – ASR-6450-13.5/ ASR-6600-18

Model			ASR-6450-13.5 ASR-6600-18
Interface	Standard	USB	Type A: Host, Type B: Slave, Speed: 2.0, USB-CDC / USB-TMC
		LAN	MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask
		External	External Signal Input External Control I/O V/I Monitor Output
		RS-232C	Complies with the EIA-RS-232 specifications
	Optional 1	GPIB	SCPI-1993, IEEE 488.2 compliant interface
	Optional 2	CAN Bus	Complies with CAN 2.0A or 2.0B based protocol
	Optional 3	Device Net	Complies with CAN 2.0A or 2.0B based protocol
Insulation resistance	Between input and chassis, output and chassis, input and output		DC 500 V, 30 MΩ or more
Withstand voltage	Between input and chassis, output and chassis, input and output		AC 1500 V or DC 2130 V, 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 (mm)			598(W)×1116(H)×906(D) (not including protrusions)
Weight			Approx. 200 kg

- 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.).
- Product specifications are subject to change without notice.

Electrical specifications – ASR -6600-24

Model	ASR-6600-24
Input ratings	
Power type	Three-phase Three-wire Delta connection Three-phase Four-wire Y connection
Voltage range[*1]	200 to 240 Vac ± 10% (Phase Voltage) 380 to 415 Vac ± 10% (Line Voltage)
Frequency range	47 Hz to 63 Hz
Power factor[*2]	0.95 or higher (typ.)
Efficiency[*2]	80 % or higher
Maximum power consumption	32 kVA or lower

Model		ASR-6600-24	
AC output			
Multi-phase output		Single-phase output	Polyphase output
Output capacity		24 kVA	1P3W: 16 kVA 3P4W: 24 kVA
Mode		1P2W	1P3W 3P4W (Y-connection)
Setting mode[*3]		---	Unbalance, Balance
Phase voltage	Setting Range[*4]	0.00 V to 175.0 V / 0.0 V to 350.0 V (sine and square wave), Setting Resolution: 0.01 V / 0.1 V	
		0.00 Vpp to 500.0 Vpp / 0.00 Vpp to 1000 Vpp (triangle and arbitrary wave), Setting Resolution: 0.01 Vpp / 0.1 Vpp / 1 Vpp	
	Accuracy[*5]	±(0.3 % of set + 0.5 V / 1 V)	
Line voltage setting range[*6]			1P3W: 0.00 V to 350.0 V / 0.00 V to 700.0 V 3P4W: 0.00 V to 303.1 V / 0.00 V to 606.2 V (sine wave only) Setting Resolution: 0.01 V / 0.1 V
Maximum current[*7]		240 A / 120 A	80 A / 40 A
Maximum peak current[*8]		Four times of the maximum RMS current	
Load power factor[*9]		0 to 1 (leading phase or lagging phase, 45 Hz to 65Hz)	
Frequency	Setting range	AC Mode: 15.00 Hz to 550.0 Hz, AC+DC Mode: 1.00 Hz to 550.0 Hz, Setting resolution: 0.01 Hz / 0.1 Hz	
	Accuracy	± 0.01% of set	
	Stability[*10]	± 0.005%	
Output on phase setting range[*11]		0.0° to 359.9° variable (Free / Fix selectable), 0.1° (1 Hz to 500 Hz), 1° (500 Hz to 550 Hz)	
Output off phase setting range[*11]		0.0° to 359.9° variable (Free / Fix selectable), 0.1° (1 Hz to 500 Hz), 1° (500 Hz to 550 Hz)	

Setting range of the phase angle[*12]	---	3P4W: L2 phase: 0° to 359.9° L3 phase: 0° to 359.9° Setting Resolution: 0.1°
Phase angle accuracy[*13]	---	45 Hz to 65 Hz: ±1.0° 15 Hz to 550 Hz: ±2.0°
DC offset[*14]	± 20 mV (typ.)	

Model		ASR-6600-24
DC output (only single-phase output)		
Output capacity		24 kW
Mode		Floating output, the N terminal can be grounded
Voltage	Setting Range	-250.0 V to +250.0 V / -500.0 V to +500.0 V, Setting Resolution: 0.01 V / 0.1 V
	Accuracy[*15]	±(|0.3 % of set| + 0.3 V / 0.6 V)
Maximum current[*16]		240 A / 120 A
Maximum peak current[*17]		Four times of the maximum current

Model	ASR-6600-24
Output Stability, Total Harmonic Distortion, Output voltage rising time and Ripple noise	
Line regulation	±0.1% or less (Phase voltage)
Load regulation[*18]	±1 V / ±2 V (phase voltage, 0 to 100%, via output terminal)
Distortion of Output[*19]	<0.3 % @1Hz to 100Hz, <0.5 % @100.1 Hz to 550 Hz
Output voltage response time[*20]	Medium: 100 µs (typ.) Slow: 300 µs (typ.)
Ripple noise[*21]	0.5 Vrms / 1 Vrms (TYP)

1) Y connection is three-phase, five-wire, Delta connection is three-phase, four-wire. (Accessories will be provided)
2) In the case of AC-INT mode, the rate output voltage, resistance load at maximum output current, 45 Hz to 65 Hz and sine wave output only.
3) Can be only set in 3P4W mode.
4) For phase voltage setting in polyphase output. In balance mode all phase are collectively set and in unbalance mode each phases are individually set.
5) For an output voltage of 10 V to 175 V / 20 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. For phase voltage setting in the polyphase output.
6) Line voltage only can be set in balance mode.
7) If the output voltage is higher than rated value, this is limited to satisfy the power capacity. If there is the DC superimposition, the active current of AC+DC satisfies the maximum current. In the case of 40 Hz or lower or 400 Hz or higher, and that the ambient temperature is 40 degree or higher, the maximum current may decrease.
8) With respect to the capacitor-input rectifying load. Limited by the maximum current.
9) External power injection or regeneration which is over short reverse power flow capacity is not available.

10) *For 45 Hz to 65 Hz, the rated output voltage, no load and the resistance load for the maximum current, and the operating temperature range.
11) L1, L2 and L3 phase can be set independ at independ mode in the polyphase output.
12) Can be set only with independ mode in polyphase output.
13) For an output voltage of 50V or higher, sine wave, same load and voltage condition for all phase.
14) In the case of the AC mode and output voltage setting to 0 V, 23°C ± 5°C
15) For an output voltage of -250 V to -10 V, +10 V to +250 V / -500 V to -20 V, +20 V to +500 V, no load, AC voltage set to 0V (AC+DC mode) and 23°C ± 5°C
16) If the output voltage is higher than rated value, this is limited to satisfy the power capacity. If there is the AC superimposition, the active current of AC+DC satisfies the maximum current. And the ambient temperature is 40 degree or higher, the maximum current may decrease.
17) Instantaneous within 3 ms, limited by the maximum current at rated output voltage.
18) For an output voltage of 75 V to 175 V / 150 V to 350 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.
19) 50 % or higher of the rated output voltage, the maximum current or lower, AC and AC+DC modes, THD+N. For the polyphase output, it is a specification for phase voltage setting.
20) 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.
21) For 5 Hz to 1 MHz components in DC mode using the output terminal on the rear panel.

Measured value display
(All accuracy of the measurement function is indicated for 23 °C±5 °C.)

		Single-phase output	Polyphase output*6
Voltage*1*2	Resolution	0.01 V / 0.1 V	
	RMS value accuracy	45 Hz to 65 Hz and DC: ± (0.5 % of rdg + 0.5 V / 1 V) 15 Hz to 550 Hz: ± (0.7 % of rdg + 1 V / 2 V)	45 Hz to 65 Hz: ± (0.5 % of rdg + 0.5 V / 1 V) 15 Hz to 550 Hz: ± (0.7 % of rdg + 1 V / 2 V)
	AVG value accuracy	DC: ± (|0.5 % of rdg| + 0.5 V / 1 V)	DC: ± (|0.5 % of rdg| + 0.5 V / 1 V)
	PEAK value accuracy*3	45 Hz to 65 Hz and DC: ± (|2 % of rdg| + 1 V / 2 V)	45 Hz to 65 Hz: ± (|2 % of rdg| + 1 V / 2 V)
Current*4	Resolution	0.01 A / 0.1 A	
	RMS value accuracy	45 Hz to 65 Hz and DC: ± (0.5 % of rdg + 0.3 A / 0.15 A) 15 Hz to 550 Hz: ± (0.7 % of rdg + 0.6 A / 0.4 A)	45 Hz to 65 Hz: ± (0.5 % of rdg + 0.15 A / 0.08 A) 15 Hz to 550 Hz: ± (0.7 % of rdg + 0.3 A / 0.15 A)
	AVG value accuracy	DC: ± (|0.5 % of rdg| + 0.6 A / 0.4 A)	DC: ± (|0.5 % of rdg| + 0.3 A / 0.15 A)
	PEAK value accuracy*5	45 Hz to 65 Hz and DC: ± (|2 % of rdg| +	45 Hz to 65 Hz: ± (|2 % of rdg| + 1.5 A

			3 A / 1.5 A)	/ 0.75 A)
Power*7*8	Active (W)	Resolution	0.1 W / 1 W / 10 W	
		Accuracy*9	± (2 % of rdg + 9 W)	± (2 % of rdg + 3 W)
	Apparent (VA)	Resolution	0.1 VA / 1 VA / 10VA	
		Accuracy	± (2 % of rdg + 18 VA)	± (2 % of rdg + 6 VA)
	Reactive (VAR)	Resolution	0.1 VAR / 1 VAR / 10VAR	
		Accuracy*10	± (2 % of rdg + 18 VAR)	± (2 % of rdg + 6 VAR)
Power factor	Range		0.000 to 1.000	
	Resolution		0.001	
Harmonic voltage Effective value (rms) Percent (%) (AC-INT and 50/60 Hz only) *11	Range		Up to 100th order of the fundamental wave	
	Full Scale		200 V / 400 V, 100%	
	Resolution		0.01 V / 0.1 V, 0.1%	
	Accuracy*12		Up to 20th: ± (0.2 % of rdg + 0.5 V / 1 V) 21th to 100th: ± (0.3 % of rdg + 0.5 V / 1 V)	
Harmonic current Effective value (rms) Percent (%) (AC-INT and 50/60 Hz only) *11	Range		Up to 100th order of the fundamental wave	
	Full Scale		252 A / 126 A, 100%	84 A / 42 A, 100%
	Resolution		0.01 A / 0.1 A, 0.1%	
	Accuracy*13		Up to 20th: ± (1 % of rdg + 3 A / 1.5 A) 21th to 100th: ± (1.5 % of rdg + 3 A / 1.5 A)	Up to 20th: ± (1 % of rdg + 1 A / 0.5 A) 21th to 100th: ± (1.5 % of rdg + 1 A / 0.5 A)

1) In the polyphase output, the specification is for phase voltage, and the DC average value display cannot be selected.
2) Accuracy values are in the case that the output voltage is within voltage setting range.
3) The accuracy is for output waveform DC or sine wave only.
4) Accuracy values are in the case that the output current is 5% to 100% of the maximum current.
5) The accuracy is for output waveform DC or sine wave only.
6) In the polyphase output, these are the specifications for each phase.
7) 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.
8) The apparent and reactive powers are not displayed in the DC mode.
9) For the load with the power factor 0.5 or higher.
10) For the load with the power factor 0.5 or lower.
11) The measurement does not conform to the IEC or other standard. Phase Voltage and Phase Current.
12) For an output voltage of 10 V to 175 V / 20 V to 350 V.
13) An output current in the range of 5 % to 100 % of the maximum current.

Model		ASR-6600-24
Others		
Protections		UVP, OVP, OCP, OTP, OPP, Fan Fail, Peak and RMS Current Limit
Display		TFT-LCD, 7 inches
Memory function		Store and recall settings, Basic settings: 10
Arbitrary Wave	Number of memories	253 (nonvolatile)
	Waveform length	4096 words
	Amplitude resolution	16 bits

General Specifications – ASR-6600-24

Model			ASR-6600-24
Interface	Standard	USB	Type A: Host, Type B: Slave, Speed: 2.0, USB-CDC / USB-TMC
		LAN	MAC Address, DNS IP Address, User Password, Gateway IP Address, Instrument IP Address, Subnet Mask
		External	External Signal Input External Control I/O V/I Monitor Output
		RS-232C	Complies with the EIA-RS-232 specifications
	Optional 1	GPIB	SCPI-1993, IEEE 488.2 compliant interface
	Optional 2	CAN Bus	Complies with CAN 2.0A or 2.0B based protocol
	Optional 3	Device Net	Complies with CAN 2.0A or 2.0B based protocol
Insulation resistance	Between input and chassis, output and chassis, input and output		DC 500 V, 30 MΩ or more
Withstand voltage	Between input and chassis, output and chassis, input and output		AC 1500 V or DC 2130 V, 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 (mm)			598(W)×1294(H)×906(D)
Weight			Approx. 250 kg

- 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.).
- Product specifications are subject to change without notice.

Information of Name Order

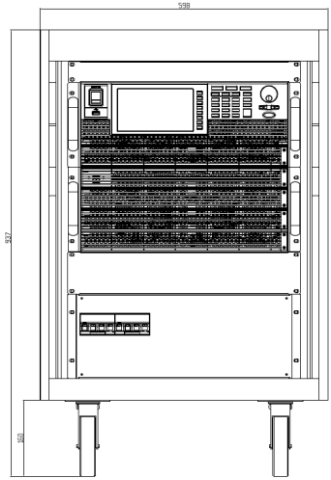
The name order of ASR-6000 series has its rules in definition for each character by order. Refer to the following contents for details.

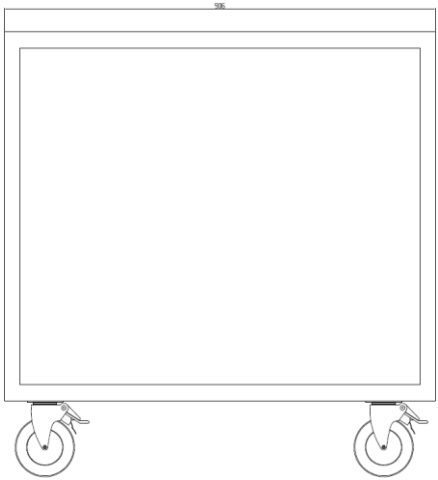
Background	The definitions below describe the meanings behind each group of alphanumeric characters, in varied colors, of naming code for ASR series models.	
Naming Definition	**ASR**	Switching Mode AC Power Source
	6	Series Name
	XX	Output Capacity **45**: 4500VA **60**: 6000VA
	0	Fixed number
	-XX	Maximum Output Capacity of Parallel Models
Lineup of ASR Series Models	**ASR-6450** **ASR-6600** **ASR-6450-09** **ASR-6600-12** **ASR-6450-13.5** **ASR-6600-18** **ASR-6600-24** **ASR-6600-30** **ASR-6600-36**	 (Release soon) (Release soon)

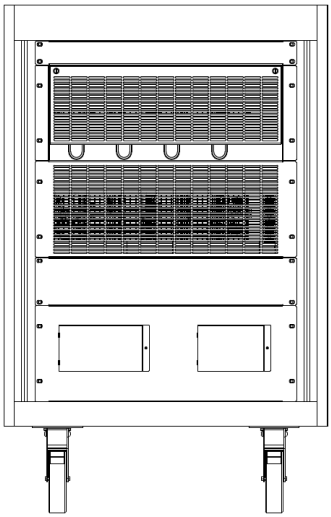
ASR-6000 Parallel Models Dimensions

ASR-6450-09/ASR-6600-12 in 15u Rack

Scale = mm

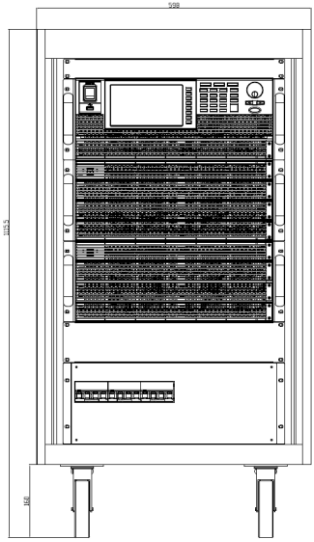


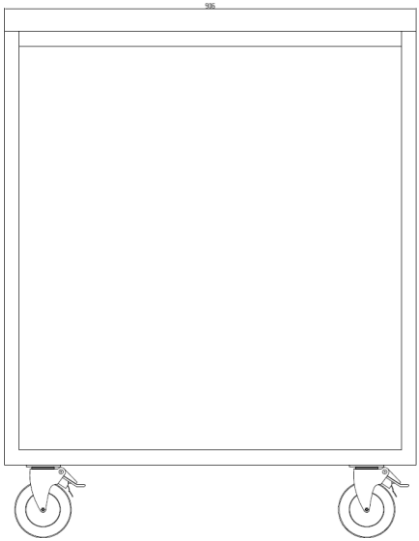


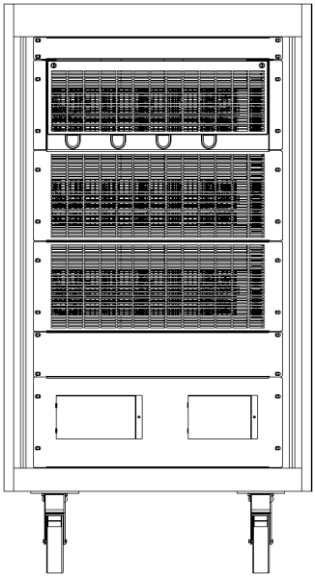


ASR-6600-18 in 19u Rack

Scale = mm

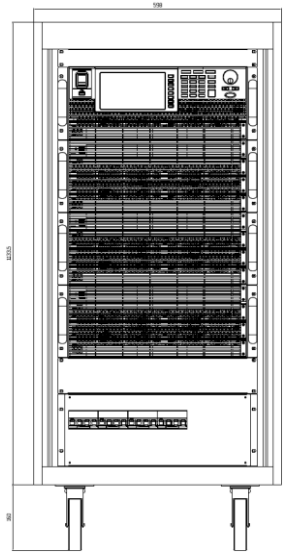


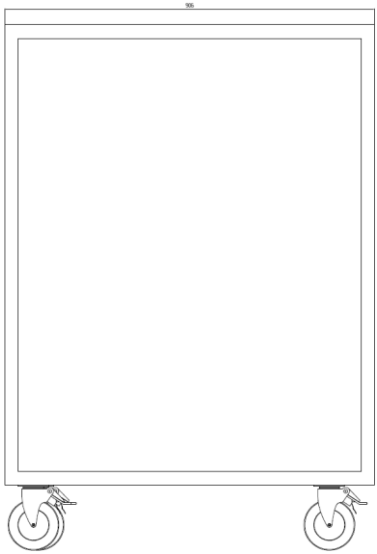


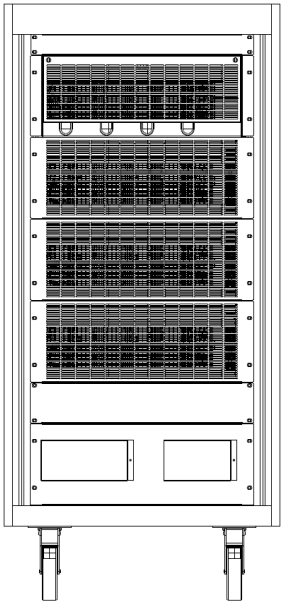


ASR-6600-24 in 23u Rack

Scale = mm







Declaration of Conformity

We

GOOD WILL INSTRUMENT CO., LTD.

declare that the below mentioned product

satisfies all the technical relations application to the product within the scope of council:

Directive: EMC; LVD; WEEE; RoHS

The product is in conformity with the following standards or other normative documents:

◎ **EMC**	
EN 61326-1 :	Electrical equipment for measurement, control and laboratory use — EMC requirements
Conducted & Radiated Emission EN 55011 / EN 55032	Electrical Fast Transients EN 61000-4-4
Current Harmonics EN 61000-3-2 / EN 61000-3-12	Surge Immunity EN 61000-4-5
Voltage Fluctuations EN 61000-3-3 / EN 61000-3-11	Conducted Susceptibility EN 61000-4-6
Electrostatic Discharge EN 61000-4-2	Power Frequency Magnetic Field EN 61000-4-8
Radiated Immunity EN 61000-4-3	Voltage Dip/ Interruption EN 61000-4-11 / EN 61000-4-34
◎ **Safety**	
EN 61010-1 :	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements

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