

# Multi-phase Programmable AC/DC Power Source

ASR-6000 Series



---

## QUICK START GUIDE



ISO-9001 CERTIFIED MANUFACTURER

**GW INSTEK**



This manual contains proprietary information, which is protected by copyright. All rights are reserved. No part of this manual may be photocopied, reproduced or translated to another language without prior written consent of Good Will company.

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.



# Table of Contents

**I**NTRODUCTION ..... 4

    ASR-6000 Series Overview ..... 4

    Appearance ..... 5

**S**ET UP ..... 13

    Input Terminal Connection ..... 13

    Copper Plate Introduction ..... 13

    Single Phase Connection ..... 14

    Delta Connection..... 15

    Y Connection ..... 16

    Output Terminal Connection ..... 17

    1P2W Output Connection ..... 17

    1P3W Output Connection ..... 19

    3P4W Output Connection ..... 20

**M**ISCELLANEOUS ..... 21

    Firmware Update ..... 21

    Specifications ..... 23

    Information of Name Order..... 25

    ASR-6000 Dimensions ..... 26

    Declaration of Conformity ..... 27



# INTRODUCTION

## ASR-6000 Series Overview

### Series lineup

The ASR-6000 series consists of 2 models, the ASR-6450 and ASR-6600, differing in 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	4500 VA	45 / 22.5 A	350 Vrms / 500 Vdc
ASR-6600	6000 VA	60 / 30 A	350 Vrms / 500 Vdc

#### 1P3W Output Condition

Model Name	Power Rating	Max. Output Current	Max. Output Voltage
ASR-6450	3000 VA	15 / 7.5 A	700 Vrms / 1000 Vdc
ASR-6600	4000 VA	20 / 10 A	700 Vrms / 1000 Vdc

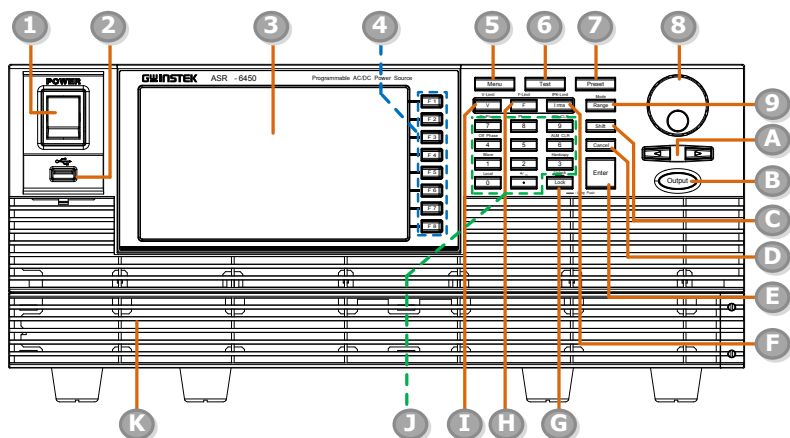
#### 3P Output Condition (Pre phase)

Model Name	Power Rating	Max. Output Current	Max. Output Voltage
ASR-6450	1500 VA	15 / 7.5 A	350 Vrms / 500 Vdc
ASR-6600	2000 VA	20 / 10 A	350 Vrms / 500 Vdc



# 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 inlet

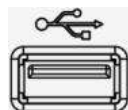
Item	Description
------	-------------

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


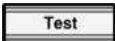






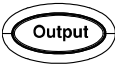



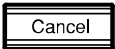
Displays the setting and measured values or menu system

Function Keys





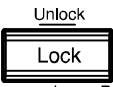
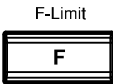


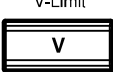
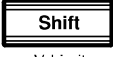

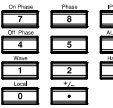


Assigned to the functions displayed on the right side of the screen.



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	<div>Mode </div>	Switches between the 100V, 200V and AUTO ranges
Output Mode	<div>Shift </div> + <div>Mode </div>	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		Turns the output on or off.
Shift Key		Turns on the shift state, which enables shortcut operations with an icon  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		Used to cancel function setting menus or dialogs.



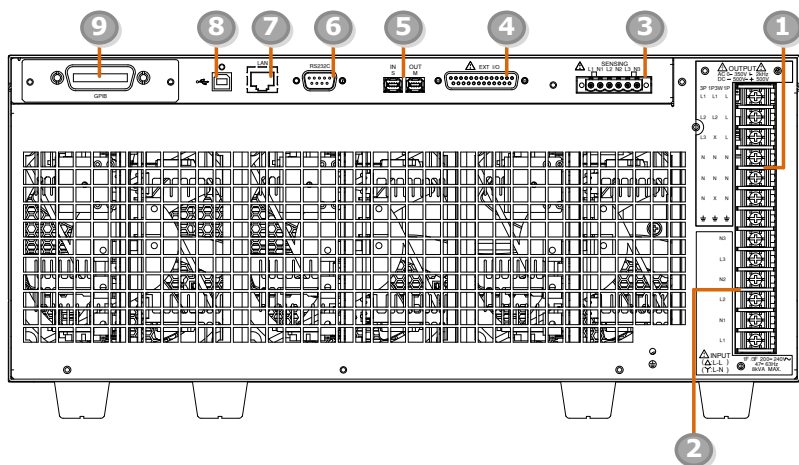
Enter Key		Confirms selections and settings.
I rms		Used for setting the maximum output current.
IPK-Limit	 IPK-Limit +	Used to set the peak output current limit value.
		
Lock/Unlock Key	 — : Long Push	Used to lock or unlock the front panel keys except output key. Simply press to lock, whilst long press to unlock.
F		Used for setting the output frequency (DC mode N/A).
F-Limit	 F-Limit +	Used for setting the output frequency limit value (DC mode N/A).
		
V		Used for setting the output voltage.
V-Limit	 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	<div>Shift</div> <div>On Phase</div> <div>7</div>	+ Sets the on phase for the output voltage.
Off Phase	<div>Shift</div> <div>Off Phase</div> <div>4</div>	+ Sets the off phase for the output voltage.
Output Waveform	<div>Shift</div> <div>Wave</div> <div>1</div>	+ Selects between the Sine, Square, Triangle and ARB 1~16 waveforms (not available for DC-INT, AC+DC-EXT and AC-EXT).
Local Mode	<div>Shift</div> <div>Local</div> <div>0</div>	+ Switches operation back to local mode from remote mode.
IPK CLR	<div>Shift</div> <div>IPK CLR</div> <div>9</div>	+ Used to clear peak output current value.
ALM CLR	<div>Shift</div> <div>ALM CLR</div> <div>6</div>	+ Clears alarms.
Hardcopy Key	<div>Shift</div> <div>Hardcopy</div> <div>3</div>	+ Used to take a screenshot. Make sure an USB flash disk is well inserted before the action.
Output Phase	<div>Shift</div> <div>Phase</div> <div>8</div>	+ Used to prompt the output phase window where 1P2W, 1P3W and 3P4W modes are available for selection.

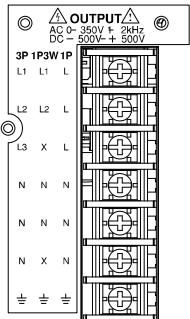
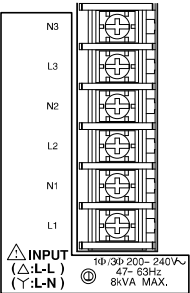
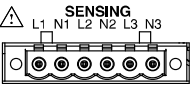
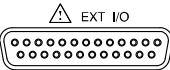
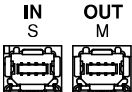


## Rear Panel



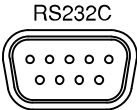
Item Index	Description
1	Output terminal
2	AC power input terminal
3	Remote sensing input terminal
4	External I/O connector
5	External IN/OUT connection in parallel function
6	RS232 connector
7	Ethernet (LAN) connector
8	USB interface connector (B Type)
9	Optional interface Slot <ul style="list-style-type: none"> <li>▪ GPIB card (ASR-003)</li> <li>▪ DeviceNet card (ASR-004)</li> <li>▪ CAN BUS card (ASR-005)</li> </ul>



Item	Description	
Output Terminal		<p>Output terminal (M4 screw type, 8 ~ 18 AWG) (Screw torque value:18kgf-cm)</p>
AC Power Input Terminal		<p>AC inlet (M4 screw type, 8 ~ 18 AWG) (Screw torque value:18kgf-cm)</p>
Remote Sensing Input Terminal		<p>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)</p>
External Control I/O Connector		<p>Used to control ASR-6000 externally by using the logic signal and monitor Sequence function status.</p>
External IN/OUT Connection in Parallel Function		<p>The IN (Slave) and OUT (Master) ports are used for connection with external unit in parallel function.</p>

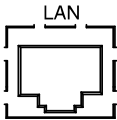


RS232C  
Connector



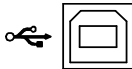
The RS232C connector for controlling the ASR-6000 remotely.

Ethernet LAN  
Port



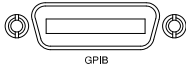
The Ethernet port is used for remote control.

USB B-type Port



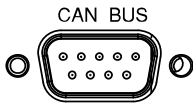
USB port for controlling the ASR-6000 remotely.

Optional GPIB  
Connector



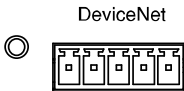
The optional GPIB connector for controlling the ASR-6000 remotely.

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.



# SET UP

## Input Terminal Connection

Background	Basically, the input terminal, which is located in the rear panel of ASR unit, can be connected through 3 methods: Single Phase, Delta and Y Connection. Depending on varied input connections, use the corresponding cooper plates and power cords for connection. Refer to the following chapters for details of each connection.
------------	---

## Copper Plate Introduction

Voltage Range of Input Connections	Input Connection	Voltage Range
	Single	Single Phase 200 - 240V: L, N and G
	Delta	Three Phase 200 - 240V: L1, L2, L3 and G
	Y	Three Phase 200 - 240V: L1, L2, L3, N and G

Copper Plate Description	Copper Plate	Description
	62SR-6K0CP101	Copper plate for delta connection input
	62SR-6K0CP201	Copper plate for single phase and Y connection input
	62SR-6K0CP301	Copper plate for delta connection input

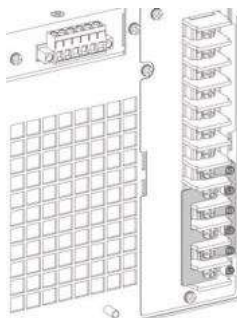
Copper Plate Quantity of Input Connections	Input Connection	Quantity of Copper Plate
	Single	62SR-6K0CP201*2pcs
	Delta	62SR-6K0CP101*1pcs, 62SR-6K0CP301*2pcs
	Y	62SR-6K0CP201*1pcs



## Single Phase Connection

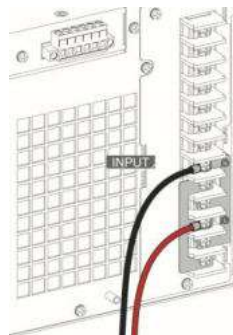
### Steps

1. Assemble the two copper plates specific for Single phase input connection with the AC input terminals. The first plate is for L1, L2 and L3 terminals, while the other plate is for N1, N2 and N3 terminals.



2. Connect the AC power cords to the AC input terminals.

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



### Note

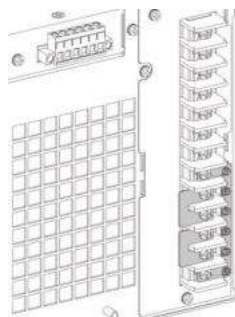
- Power input cords are not included in this product.
- For the specific installation on protective lid of input terminal, please refer to User Manual.



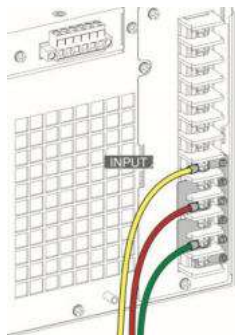
## Delta Connection

### Steps

1. Assemble the three copper plates specific for Delta input connection with the AC input terminals. The 1<sup>st</sup> plate is for N3 and L1 terminals. The 2<sup>nd</sup> second plate is for L3 and N2 terminals, while the 3<sup>rd</sup> plate is for L2 and N1 terminals.



2. Connect the AC power cords to the AC input terminals.
  - Red → Line (N2)
  - Green → Neutral (N1)
  - Yellow → Neutral (N3)



Note

- Power input cords are not included in this product.
- For the specific installation on protective lid of input terminal, please refer to User Manual.

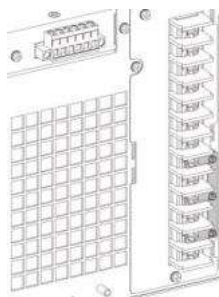


## Y Connection

---

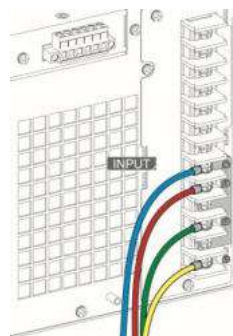
### Steps

1. Assemble the copper plate specific for Y input connection with the AC input connection with the AC input terminals. The copper plate is for N1, N2 and N3 terminals.



2. 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.
- For the specific installation on protective lid of input terminal, please refer to User Manual.



## Output Terminal Connection

**Background** The output terminal can output power in three mode: 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.

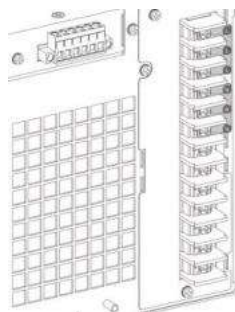


### CAUTION

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

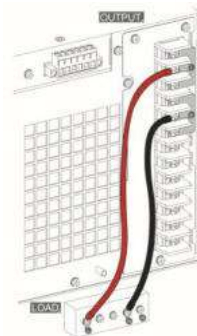
- Steps**
1. Disconnect the unit from the mains power socket and turn the power switch off.
  2. Assemble the two copper plates specific for 1P2W output connection with the AC output terminals. The first plate is for N\*3 terminals, while the other plate is for L\*3 terminals.





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

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

**Note**

- The input & output terminals necessitate connectivity through ring-type connectors.
- For the specific installation on protective lid of output terminal, please refer to User Manual.
- 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.

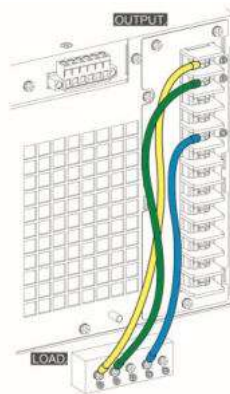


## 1P3W Output Connection

---

### Steps

1. Disconnect the unit from the mains power socket and turn the power switch off.
2. Connect the output wires to the AC output terminals as follows:
  - Yellow → Line (L1)
  - Green → Line (L2)
  - Blue → Neutral (N)



### Note

- The input & output terminals necessitate connectivity through ring-type connectors.
  - For the specific installation on protective lid of output terminal, please refer to User Manual.
-

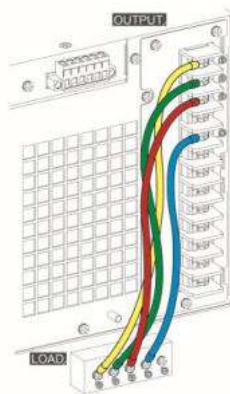


## 3P4W Output Connection

---

### Steps

1. Disconnect the unit from the mains power socket and turn the power switch off.
2. Connect the output wires to the AC output terminals as follows:
  - Yellow → Line (L1)
  - Green → Line (L2)
  - Red → Line (L3)
  - Blue → Neutral (N)



### Note

- The input & output terminals necessitate connectivity through ring-type connectors.
  - For the specific installation on protective lid of output terminal, please refer to User Manual.
-



# MISCELLANEOUS

## Firmware Update

### Background

The ASR series firmware can be upgraded using the USB A port on the front panel. See your local distributor or the GW Instek website for the latest firmware information.

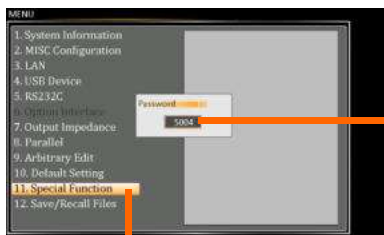


### Note

- Ensure the DUT is not connected.
- Ensure the output is off.

### Steps

1. Insert a USB Flash Drive into the USB port on front panel of the ASR.  
The USB drive should include the **gw\_sb6.upg** file in a directory name "gw"(USB\gw:).
2. Press the *Menu* key. The Menu setting will appear on the display.
3. Use the scroll wheel to go to item 11, *Special Function* and press *Enter*.

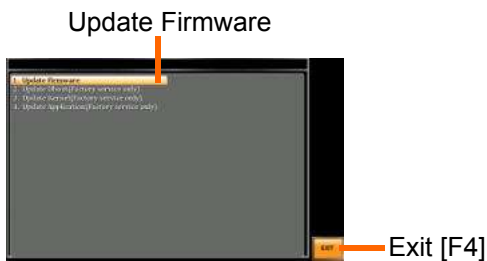


Enter  
Password

Special Function



4. Key in the password when prompted and then press *Enter*.  
The password is “5004”.
5. Go to Item 1, *Update Firmware* and press *Enter*.



6. Wait for the unit to update. Upon completion the unit will automatically reboot.



## Specifications

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

### Electrical specifications

Model	ASR-6450	ASR-6600
Input ratings		
Power type	Single-phase Three-phase, Delta or Y connection selectable	
Voltage range <sup>*1</sup>	200 Vac to 240 Vac $\pm 10\%$ phase voltage (Delta: L-L, Y: L-N)	
Frequency range	47 Hz to 63 Hz	
Power factor <sup>*2</sup>	0.95 or higher (typ.)	
Efficiency <sup>*2</sup>	80 % or higher	
Maximum power consumption	6 kVA or lower	8 kVA or lower

### General Specifications

Model	ASR-6450	ASR-6600
Interface	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
	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 M $\Omega$ 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/-3-12 (Class A, Group 1) EN 61000-3-3/-3-11 (Class A, Group 1) EN 61000-4-2/-4-3/-4-4/-4-5/-4-6/-4-8/-4-11/-4-34 (Class A, Group 1) EN 55011 (Class A, Group1)
Safety		EN 61010-1
Vibration, Shock and Transportation Integrity		ISTA 2A Test Procedure
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)		430(W)×176(H)×590(D) (not including protrusions)
Weight		Approx. 40 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.

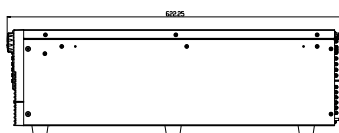
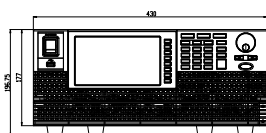
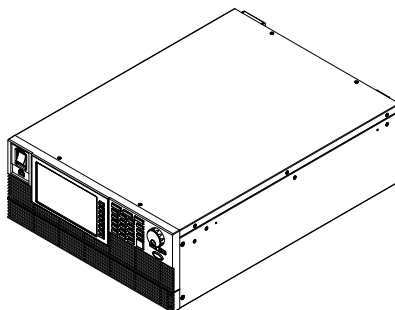
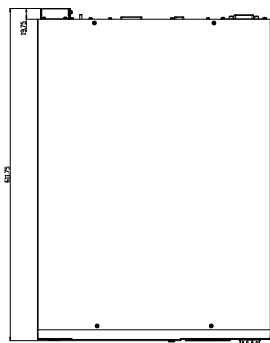
Background	The definitions below describe the meanings behind each group of alphanumeric characters, in varied colors, of naming code for ASR series models.	
Naming Definition	ASR	Switching Mode AC Power Source
	6	Series Name
	XX	Output Capacity 45: 4500VA 60: 6000VA
	0	Fixed number
	-XX	Maximum Output Capacity of Parallel Models
Lineup of ASR Series Models	ASR-6450 ASR-6600 ASR-6450-09 (release soon) ASR-6600-12 (release soon) ASR-6450-13.5 (release soon) ASR-6600-18 (release soon) ASR-6450-22.5 (release soon) ASR-6600-24 (release soon) ASR-6450-27 (release soon) ASR-6600-30 (release soon) ASR-6600-36 (release soon)	



# ASR-6000 Dimensions

## ASR-6450/6600

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

**GOODWILL INSTRUMENT CO., LTD.**

No. 7-1, Jhongsing Road, Tucheng District, New Taipei City 236, Taiwan

Tel: [+886-2-2268-0389](tel:+886-2-2268-0389)

Fax: [+886-2-2268-0639](tel:+886-2-2268-0639)

Web: <http://www.gwinstek.com>

Email: [marketing@goodwill.com.tw](mailto:marketing@goodwill.com.tw)

**GOODWILL INSTRUMENT (SUZHOU) CO., LTD.**

No. 521, Zhujiang Road, Snd, Suzhou Jiangsu 215011, China

Tel: [+86-512-6661-7177](tel:+86-512-6661-7177)

Fax: [+86-512-6661-7277](tel:+86-512-6661-7277)

Web: <http://www.instek.com.cn>

Email: [marketing@instek.com.cn](mailto:marketing@instek.com.cn)

**GOODWILL INSTRUMENT EURO B.V.**

De Run 5427A, 5504DG Veldhoven, The Netherlands

Tel: [+31-\(0\)40-2557790](tel:+31-(0)40-2557790)

Fax: [+31-\(0\)40-2541194](tel:+31-(0)40-2541194)

Email: [sales@gw-instek.eu](mailto:sales@gw-instek.eu)