

Programmable AC Source

61511/61512/61611/61612

Quick Start Guide

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CHROMA ATE INC.

66 Hwaya 1st Rd., Kueishan Hwaya Technology Park, Taoyuan County 33383, Taiwan

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CHROMA ATE INC.

66 Hwaya 1st Rd., Kueishan Hwaya Technology Park,

Taoyuan County 33383, Taiwan

Tel: 886-3-327-9999

Fax: 886-3-327-2886

e-mail: info@chromaate.com

www: <http://www.chromaate.com/>

Material Contents Declaration

The recycling label shown on the product indicates the Hazardous Substances contained in the product as the table listed below.



: See <Table 1>.



: See <Table 2>.

<Table 1>

Part Name	Hazardous Substances					
	Lead	Mercury	Cadmium	Hexavalent Chromium	Polybrominated Biphenyls	Polybromodiphenyl Ethers
	Pb	Hg	Cd	Cr ⁶⁺	PBB	PBDE
PCBA	O	O	O	O	O	O
CHASSIS	O	O	O	O	O	O
ACCESSORY	O	O	O	O	O	O
PACKAGE	O	O	O	O	O	O

“O” indicates that the level of the specified chemical substance is less than the threshold level specified in the standards of SJ/T-11363-2006 and EU 2005/618/EC.

“x” indicates that the level of the specified chemical substance exceeds the threshold level specified in the standards of SJ/T-11363-2006 and EU 2005/618/EC.

Disposal

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being. When replacing old appliances with new one, the retailer is legally obligated to take back your old appliances for disposal at least for free of charge.



<Table 2>

Part Name	Hazardous Substances					
	Lead	Mercury	Cadmium	Hexavalent Chromium	Polybrominated Biphenyls	Polybromodiphenyl Ethers
	Pb	Hg	Cd	Cr ⁶⁺	PBB	PBDE
PCBA	×	○	○	○	○	○
CHASSIS	×	○	○	○	○	○
ACCESSORY	×	○	○	○	○	○
PACKAGE	○	○	○	○	○	○

“○” indicates that the level of the specified chemical substance is less than the threshold level specified in the standards of SJ/T-11363-2006 and EU 2005/618/EC.

“×” indicates that the level of the specified chemical substance exceeds the threshold level specified in the standards of SJ/T-11363-2006 and EU 2005/618/EC.

1. Chroma is not fully transitioned to lead-free solder assembly at this moment; however, most of the components used are RoHS compliant.
2. The environment-friendly usage period of the product is assumed under the operating environment specified in each product's specification.

Disposal

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being. When replacing old appliances with new one, the retailer is legally obligated to take back your old appliances for disposal at least for free of charge.



Safety Summary

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or specific WARNINGS given elsewhere in this manual will violate safety standards of design, manufacture, and intended use of the instrument. *Chroma* assumes no liability for the customer's failure to comply with these requirements.



BEFORE APPLYING POWER

Verify that the power is set to match the rated input of this power supply.



PROTECTIVE GROUNDING

Make sure to connect the protective grounding to prevent an electric shock before turning on the power.



NECESSITY OF PROTECTIVE GROUNDING

Never cut off the internal or external protective grounding wire, or disconnect the wiring of protective grounding terminal. Doing so will cause a potential shock hazard that may bring injury to a person.



FUSES

Only fuses with the required rated current, voltage, and specified type (normal blow, time delay, etc.) should be used. Do not use repaired fuses or short-circuited fuse holders. To do so could cause a shock or fire hazard.



DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE

Do not operate the instrument in the presence of flammable gases or fumes.



DO NOT REMOVE THE COVER OF THE INSTRUMENT

Operating personnel must not remove the cover of the instrument. Component replacement and internal adjustment can be done only by qualified service personnel.

Safety Symbols



DANGER – High voltage.



Explanation: To avoid injury, death of personnel, or damage to the instrument, the operator must refer to an explanation in the instruction manual.



High temperature: This symbol indicates the temperature is now higher than the acceptable range of human. Do not touch it to avoid any personal injury.



Protective grounding terminal: To protect against electrical shock in case of a fault. This symbol indicates that the terminal must be connected to ground before operation of equipment.



The **WARNING** sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a **WARNING** sign until the indicated conditions are fully understood and met.



The **CAUTION** sign denotes a hazard. It may result in personal injury or death if not noticed timely. It calls attention to procedures, practices and conditions.



The **Notice** sign denotes important information in procedures, applications or the areas that require special attention. Be sure to read it carefully.

Table of Contents

1.	Introduction	1
1.1	Product Overview	1
1.2	Key Features.....	1
1.3	Specification.....	2
1.4	Names of Parts	2
1.4.1	Front Panel	2
1.4.2	Rear Panel.....	5
2.	Installation	8
2.1	Initial Inspection	8
2.2	Preparation for Use.....	8
2.3	Requirements for Input Power	8
2.3.1	Ratings.....	8
2.3.2	Input Connection.....	8
2.4	Output Connection.....	12
2.5	Remote Sense Connection.....	12

1. Introduction

1.1 Product Overview

Chroma 61511/61512/61611/61612 Series is a highly efficient programmable AC Source, which provides a low distortion sine wave output for power accuracy. The DSP microprocessor generates an accurate stable output voltage and frequency. The PWM designed power stage allows apparent power into loads. Its front panel has a RPG (Rotary Pulse Generator) and keypad control for setting the output voltage and frequency, while the LCD gives users complete operating status. Remote programming is accomplished by the GPIB bus, RS-232C serial port or USB port.

1.2 Key Features

A. Configuration

- Local operation by the keypad on the front panel
- Remote operation via GPIB or RS-232C or USB interface
- Remote control a terminal on front or rear panel using the Chroma Digital Controller A615101 (optional)
- Protection against over power, over current, over temperature and fan failure
- Thermostatically controlled fan speed
- Built-in output isolation relays

B. Input/Output

- Selectable output voltage with full scale of 150V/300V/Auto (3 ranges)
- Analog (simulation) reference voltage for remote control
- V, I, Po, CF, PF, Idc, Vdc, Vac, Iac, Ipk, Vpk and VA measurements
- Remote inhibited control
- AC ON/OFF output signal

1.3 Specification

For detail specifications of model 61511/61512/61611/61612, please refer to the User's Manual in the CD came along with the shipment.

1.4 Names of Parts

1.4.1 Front Panel

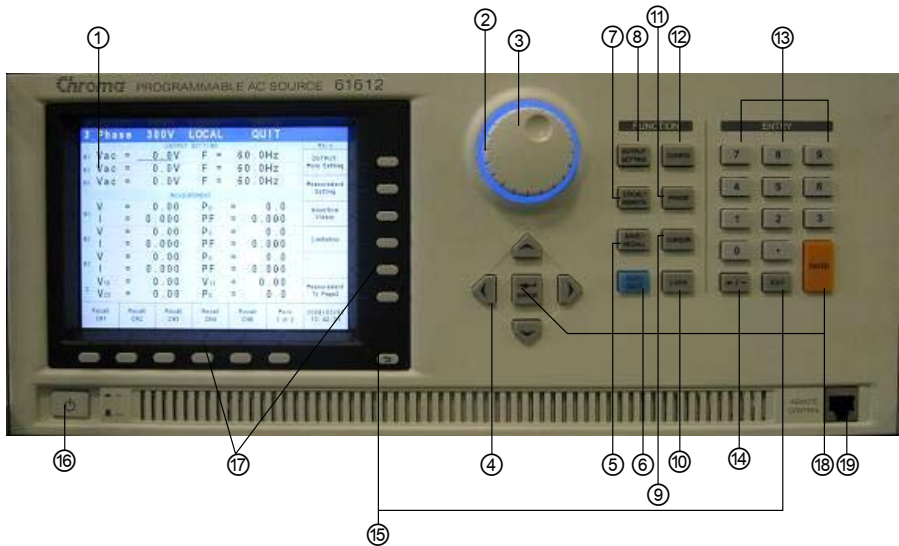



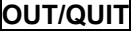








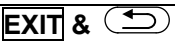



Figure 1-1 Front Panel

Item	Symbol	Description
1		Display: The 6.5" LCD displays the configuration, output setup, and measurement results.
2		Indicator LED: It is the Power On indicator surrounding the rotary knob showing the activation status.
3		RPG Rotary: Users can turn the RPG rotary to adjust the voltage, frequency and input programmed data or options.

4		Cursor Movement Keys: These four keys move the cursor in different directions. In normal mode, pressing any of these four keys will change the cursor position.
5		SAVE or RECALL: Press this on MAIN PAGE can save the output setting. By pressing this key on CHOICE PAGE users can save the system data.
6		OUT/QUIT: Press this key to Enable/Disable the output voltage of the AC source.
7		LOCAL/REMOTE: Switches the "Remote" control mode to "LOCAL" from front panel input.
8		OUTPUT SETTING: Changes the screen to "Output: More Setting" for additional settings.
9		CURSOR: It is used to set or adjust the value.
10		LOCK: Press it for 1 second can lock up "all keys" and the "rotary". Press it for 3~3.5 seconds to unlock them.
11		PHASE: It sets single/3-phase.
12		CONFIG: It changes the screen to "config choose page" for various settings.
13		Numeric and Decimal: Users can use "numeric keys" and "decimal key" to input digital data.
14		Backward and Decreasing: Press this key to delete the inputted number. It shows " - " if no number exists.
15		EXIT: Press it to return to previous screen.
16		Main Power Switch: It turns on or shut off the power.


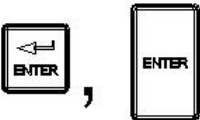
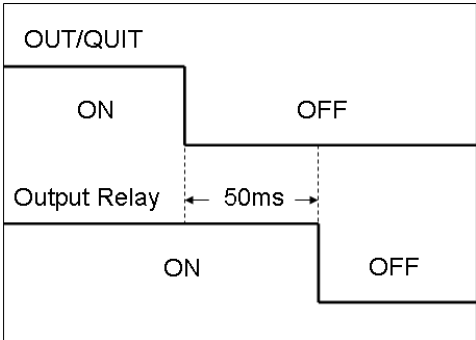
17		Indicator: It refers to the description on screen for parameter and function setting.
18		ENTER: It confirms the setting of parameter.
19	REMOTE CONTROL	Remote Control Terminal: It can work with Chroma Digital Controller A615101 (optional) for remote control.

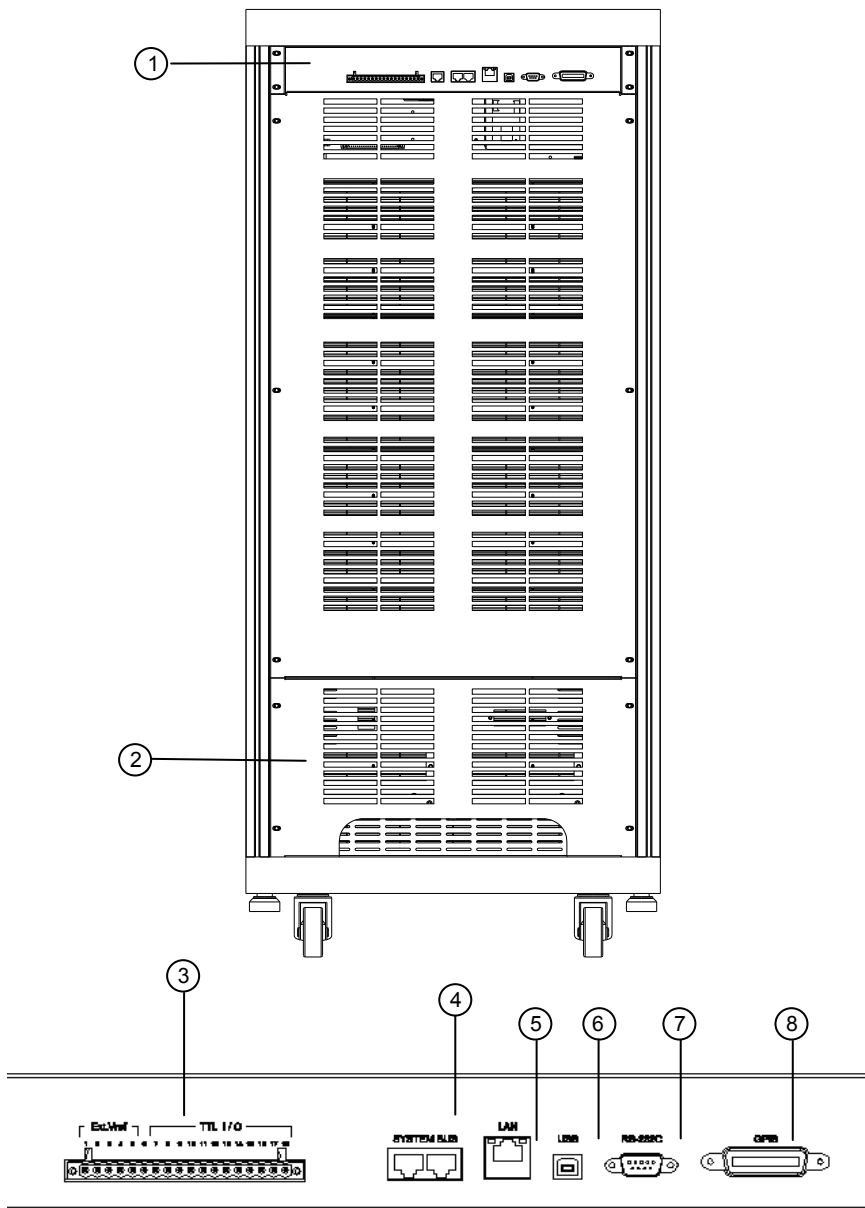
Table 1-1 Front Panel Description

 **Notice**

To extend the product life of output relay, it will delay 50ms for release after pressing **QUIT**. When inductive load is connected, a discharge path will be provided for the inductive current within the period of time delayed due the feature of continuous flow.



1.4.2 Rear Panel



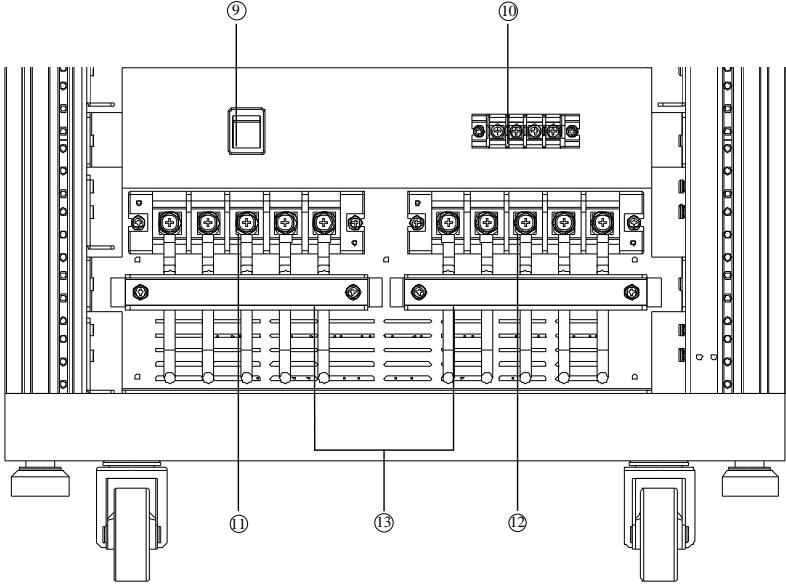


Figure 1-2 Rear Panel

Item	Name	Description
1	Rear Panel Output Interface	It includes Ext.V/TTL, Remote Control, GPIB and USB...etc.
2	I/O Terminal Case	It has the input/output terminal. The connector inputs power source from the mains (3-phase power) and outputs power source to the UUT.
3	Ext. Vref./TTL I/O	It inputs the control waveform amplitude from external analog (simulated) signal with TTL transmission control signal (Fault_out, Remote inhibit and AC_ON.)
4	SYSTEM BUS	It is applicable for signal transmission in between 2 AC Sources connected in parallel.
5	Ethernet	It is the terminal that can be controlled by a network (LAN).
6	USB	It is used to connect the remote controller to computer for remote operation.
7	RS232C	It is a 9-pin D type male connector that transmits control commands among distant PCs for remote operation.

8	GPIB Connector	Remote controller uses GPIB bus to connect the PC via the connector for remote operation.
9	Cable Connector	Select the mapping cable connector for different input cable (Δ -Y). (Note: Not valid for 3-phase voltage input 480Vac (Y: L-L).)
10	Remote Sense Connector	It is the terminal that senses the load directly to avoid any voltage drop when connecting cable. Ensure the "SL" terminal of remote sense connector is connected to the "L" terminal of Load, and the "SN" is connected to the "N" of Load. Reverse polarity cannot be connected.
11	Input Connecting Terminal	It connects the mains to AC Source as input.
12	Output Connection Terminal	It connects to UUT for output.
13	I/O Cable Secure Strip	It secures the input/output connection cable.

Table 1-2 Rear Panel Description

2. Installation

2.1 Initial Inspection

Before shipment, this instrument was inspected and found to be free of mechanical and electrical defects. As soon as the instrument is unpacked, inspect for any damage that may have occurred in transit. Save all packing materials in case the instrument has to be returned. If damage is found, please file claim with carrier immediately. Do not return the instrument to Chroma without prior approval.

2.2 Preparation for Use

First the instrument must be connected to an appropriate AC line input. Since the instrument is cooling by fans, it must be installed in a place with good circulation of air. It should be in an area where the ambient temperature does not exceed 40°C.

2.3 Requirements for Input Power

2.3.1 Ratings

Input Voltage Range	:	190-250V(Delta: L-L, Y: L-N) 250-305V(Y: L-N)
Input Frequency	:	47-63 Hz
Maximum Current	:	61511/61611 Δ : 80A , Y : 70A 61512/61612 Δ : 120A , Y : 90A



The AC Source may be damaged if the input voltage exceeds the configured range.

2.3.2 Input Connection

The input terminal block is located beneath the device's rear panel. The power cord should be rated at least 85°C and the current rating of power line input must be greater than or equal to the maximum current rating of AC Source. The input selector is located on the rear panel (see Figure

2-2.) Adjust the selector according to the power input (Delta or Y) method.

⚠ WARNING : There are two different input voltage ratings. One is 380 V_{LL} 3-phase with 5-wire (Y), and the other is 220 V_{LL} 3-phase with 4-wire (Δ). Be sure to verify the main voltage before use. The connection for both is the same; however, it is necessary to switch the Δ- Y switch on the rear panel to appropriate position.

See Figure 2-2 and perform the steps below accordingly:

1. Remove the safety cover from the back of the AC Source.
2. Connect the wire to the AC Source terminal blocks (see Figure 2-2.)
3. Slide the safety cover over the AC input terminal strip.
4. Secure it with the I/O cable trim strip and screws.
5. Assemble the safety cover back to the AC Source.

⚡ CAUTION : To protect the operators, the wire connected to GND terminal must be connected to the earth. Under no circumstances shall this AC Source be operated without grounding adequately.

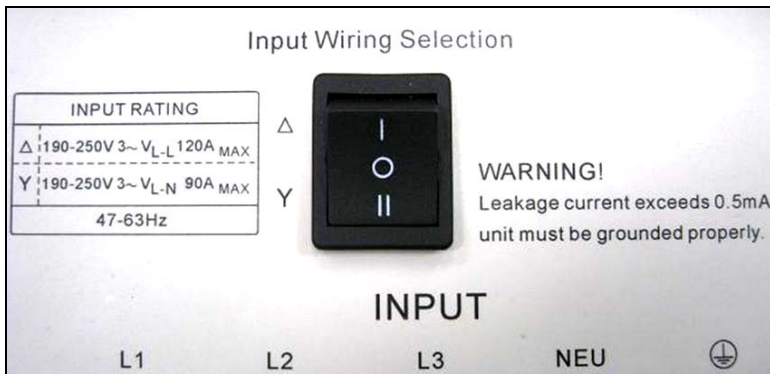


Figure 2-1 Input Selector

👉 Notice : If users turn the Δ-Y switch to Δ, but the actual input wiring is Y, the AC Source will beep to warn the error. Users need to power it off first and turn the Δ-Y switch to Y to resolve the problem.

Notice

1. Installation of the wire must be conducted by professional personnel complying with local electrical codes.
2. If the input wiring selection is 220V 3~ (Δ type) Max 120A/Phase, the specification of Circuit Breaker configured for Δ type needs to be 220Vac/80A (61511) & 120A (61512) at least.
3. If the input wiring selection is 380V 3~ (Y type) Max 70A/Phase, the specification of Circuit Breaker configured for Y type needs to be 380Vac/70A (61511) & 90A (61512) at least.
4. This function is not valid for 3-phase voltage input 480Vac(Y: L-L).

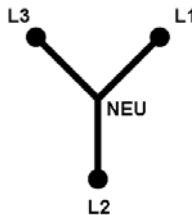
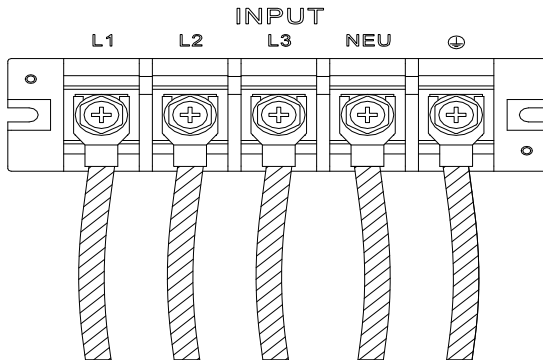


Figure 2-2 3-Phase Power Input Connection (Y Connection)

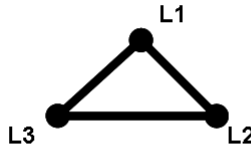
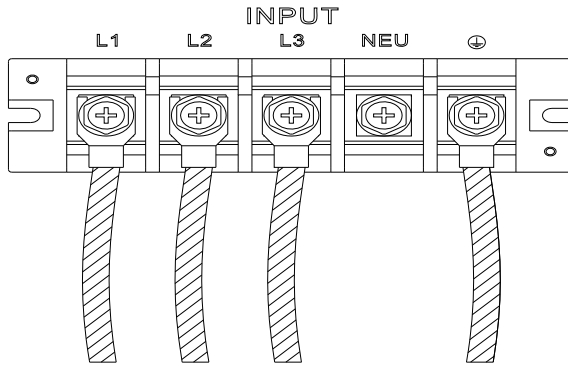


Figure 2-3 3-Phase Power Input Connection (Delta Connection)

 **Notice**

Please be aware of the color distinction of insulation tube or the wire before connecting the power wire. The black insulation tube or power wire is used for L1, L2 and L3, the blue insulation tube or power wire is used for NEU while the green insulation tube or power wire is used for GROUND.

2.4 Output Connection

The output terminal block is located at the rear of AC Source. The Load is connected to the output terminals. To meet the safety requirements, the I/O input/output wires need to be tied up by a safety strip and the cover must be secured. The wire diameter should be large enough to connect to the load so that it will not overheat when outputting current, see Figure 2-5.



The output terminal labeled “L” is the “+” terminal and the output terminal labeled “COM/N” is the “-” terminal when output voltage contains DC composition.



For proper ventilation, the hardware should be placed at least 1 meter distance from the device front and rear panel. Do not place the hardware against the wall or other objects.

2.5 Remote Sense Connection

The remote sense function of AC Source monitors the voltage at the load and the automatic compensation ensures the voltage delivered to load is the one programmed.

Remove the connecting wires “ ψ 1”, “ ψ 2”, “ ψ 3” and “COM” from Remote Sense terminal, and connect remote sense to load as Figure 2-4 shows. As the sensing leads transmit only a few milliamperes, the sensing wires are much thinner than the load leads. The sensing leads are part of the feedback circuit of AC Source, so they must be low resistance for the best performance. Connect the sensing leads carefully so that they will not be open-circuited. If the sensing leads are disconnected or become open-circuited during operation, the AC Source may be unable to output. The sensing leads must be a twisted pair to minimize the interference from external voltages. The sensing leads need to be connected to the load as close as possible.

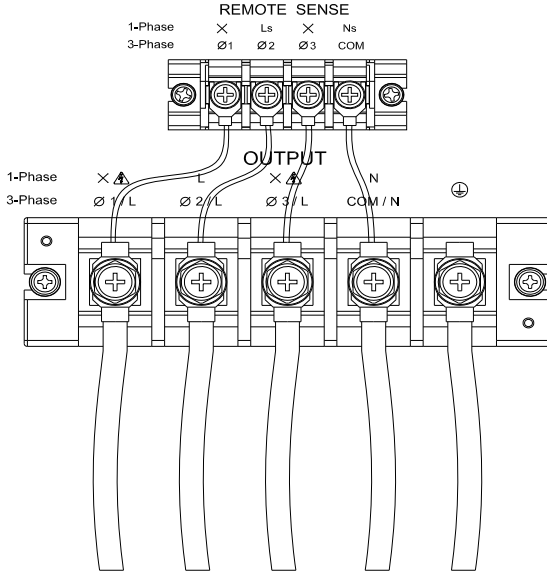


Figure 2-4 Output & Remote Sense Connection

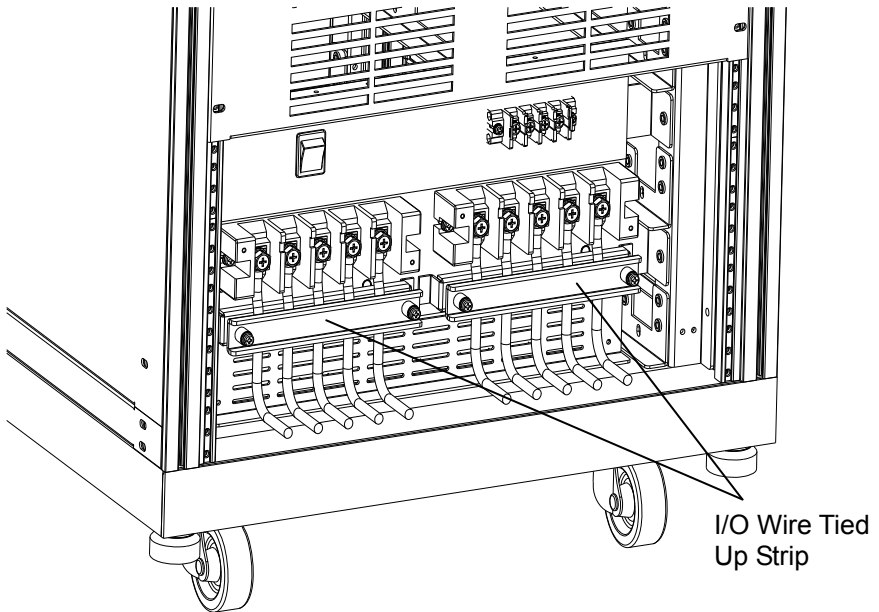


Figure 2-5 Input/Output Wire Securing Diagram



Headquarters 總公司

CHROMA ATE INC. 致茂電子股份有限公司

66, Hwa-ya 1st Rd., Hwaya Technology Park,

Kueishan 33383, Taoyuan, Taiwan

台灣桃園縣33383龜山鄉華亞科技園區華亞一路66號

TEL: + 886 - 3 - 327 - 9999

FAX: + 886 - 3 - 327 - 8898

e-mail: info@chromaate.com