



Programmable DC Power Supply
6200P Series
Quick Start Guide



Programmable DC Power Supply 62000P Series 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.



<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.

“×” 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.





Declaration of Conformity

For the following equipment :

Programmable DC Power Supply

(Product Name/ Trade Name)

62006P-30-80, 62006P-100-25, 62006P-300-8, 62012P-40-120, 62012P-80-60,
62012P-100-50, 62012P-600-8, 62024P-80-60, 62024P-100-50, 62050P-100-100,
62024P-40-120, 62024P-600-8

(Model Designation)

CHROMA ATE INC.

(Manufacturer Name)

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

(Manufacturer Address)

Is herewith confirmed to comply with the requirements set out in the Council Directive on the Approximation of the Laws of the Member States relating to Electromagnetic Compatibility (2004/108/EC) and Low-voltage Directive (2006/95/EC). For the evaluation regarding the Directives, the following standards were applied :

EN 61326-1:2006 Class A

EN 61010-1:2010 (Third Edition)

The following importer/manufacturer or authorized representative established within the EUT is responsible for this declaration :

CHROMA ATE INC.

(Company Name)

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

(Company Address)

Person responsible for this declaration:

Mr. Benjamin Huang

(Name, Surname)

Division Vice President

(Position/Title)

Taiwan

2013.05.28

(Place)

(Date)

Benjamin Huang
(Legal Signature)

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.

WARNING

Touching the output terminal on the rear panel when the power or current is set and outputting may result in personal injury or death.

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.

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1. Overview

1.1 Introduction

Chroma 62000P Series are constant DC Power Supplies that can provide stable DC output and accurate measurement for voltage and current.

The features of 62000P Series DC Power Supply are:

- (1) Voltage mode with two loops control ➡ able to provide stable and quick responded output, also to set the slew rate of output voltage and current.
- (2) Constant power output ➡ users are able to get the rated power output within the maximum output voltage and current range (62012P-80-60: 80V-60A).
- (3) 16-bit ADC/16-bit DAC ➡ provides excellent resolution.
- (4) Lower transient spike and transient response time ➡ makes the unit under test gets the most stable output and the best protection under the circumstance of load variation
- (5) Editing mode (Programming Mode) for output waveform ➡ provides multiple output voltage and current combinations in time for long period test.
- (6) Rotary knob and keyboard control on the front panel ➡ to set the output voltage and current.
- (7) Large LCD panel ➡ gives users a complete operation state.
- (8) Via GPIB, RS-232C, USB, Ethernet or APG (analog programmable interface) interface ➡ to do remote control.

1.2 Function Keys

1.2.1 Front Panel

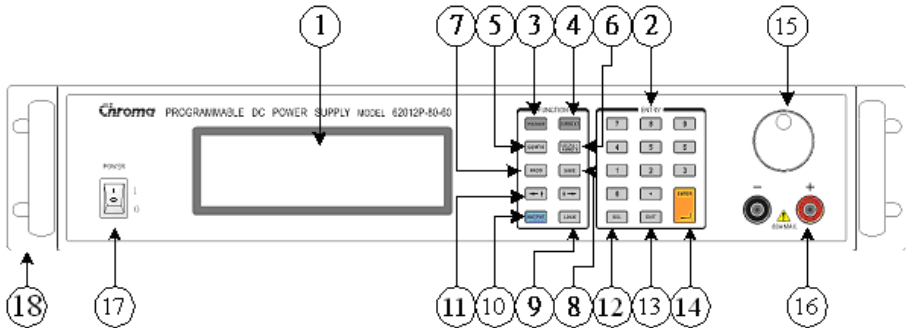


Figure 1 Front Panel of 62006P, 62012P & 62024P

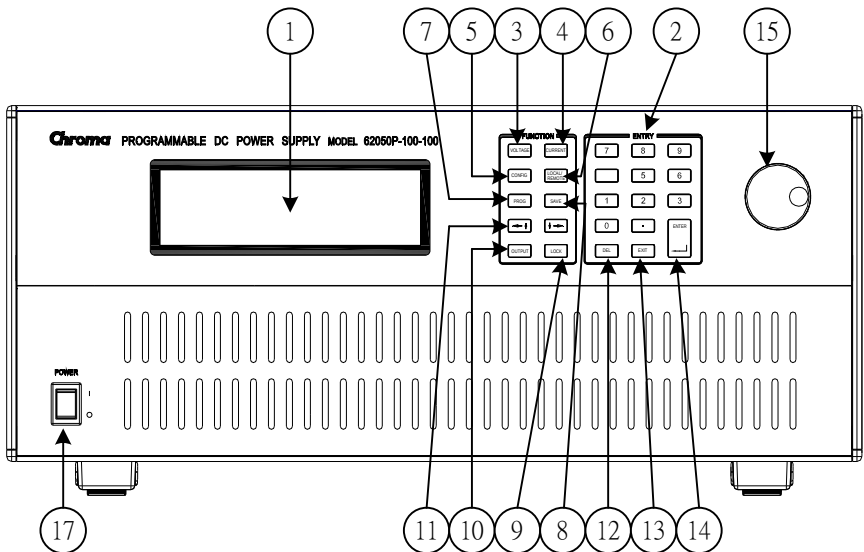


Figure 2 Front Panel of 62050P

Item	Symbol	Description
1		DISPLAY: LCD Display: it shows the output settings and measured result.
2	 to and	Numeric and Decimal Point: Users can use the numeric keys and the decimal point key to enter digital data.
3		Voltage Setting Key: Enters voltage setting mode. Users can use numeric keys or rotary knob to input voltage values
4		Current Setting Key: Enters current limit setting mode. Users can use numeric keys or rotary knob to input current limit values.
5		CONFIG Key: Press this key to skip to “Config Choose Page” for setting various functions.
6		LOCAL/REMOTE Switch Key: Press this key to switch the control mode to “Front Panel Input” or “Remote Control”.
7		PROGRAM Key: Press this key to skip to “Program Function Page” for setting waveform editing mode.
8		SAVE Key: Press this key to save the settings in “Program and Config Function Page”
9		LOCK Key: Press this key to lock all keys and rotary knob. To unlock ➡ press “  ” for 3 seconds to release it.
10		OUTPUT Key: Press this key to control the output to “ON” or “OFF”.

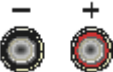
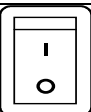
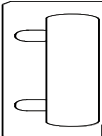
Item	Symbol	Description
11		Cursor Movement Keys: Use “  ” and “  ” keys to move the cursor to the parameter to be modified.
12		Delete Key: Press this key to delete the input value.
13		EXIT Key: Press this key to go to previous screen. If this key is pressed before “  ” is pressed, the screen will go back to “MAIN PAGE” and the data will not be saved.
14		ENTER Key: Press this key to confirm the parameter settings.
15		ROTARY Knob: Users can turn the knob “  ” to input data or select item.
16		Output Terminal on Front Panel: The maximum output current differs from models when connected with the output terminals on the rear panel. Note: 30V, 40V, 300V and 600V Models have no front panel output terminal.
17		Main Power Switch: It switches the power on or off.
18		Rack Bracket:(Option) Use the left (right) bracket to fit the Power Supply on Rack.

Table 1 Description of Front Panel

1.2.2 Rear Panel

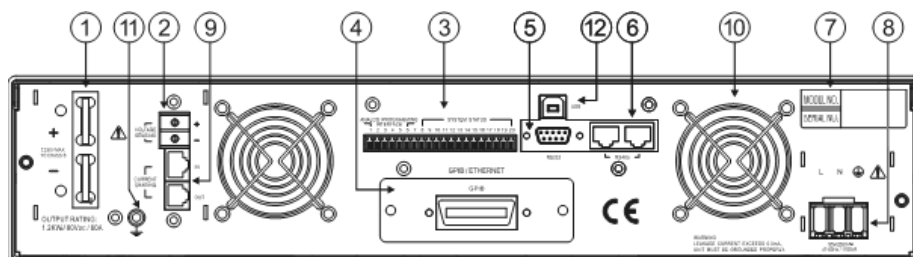


Figure 3 Rear Panel of 62006P, 62012P, 62024P Low/Middle Voltage (30V/40V/80V/100V)

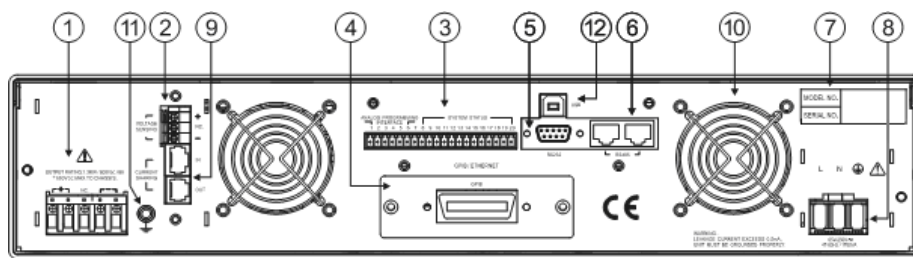


Figure 4 Rear Panel of 62006P, 62012P, 62024P High Voltage Model (300V/600V)

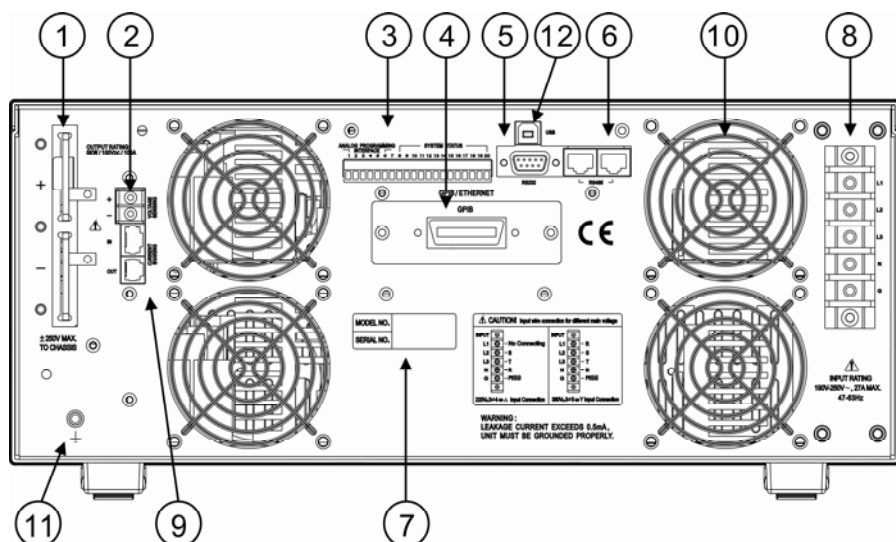


Figure 5 Rear Panel of 62050P Model

Item	Name	Description
1	Output terminal	The output terminals of DC Power Supply.
2	Remote Sense Connector	Connecting this connector to load can compensate the voltage drop generated due to cable resistance. Be sure to connect the remote sense connector “+” to the positive output terminal and “-” connector to the negative output terminal. Do not connect the remote sense connector to the “+”, “-” output terminal reversely.
3	APG & Status Signal Connecting Terminal	There are two sections for these 20 pins signals. Pin 1~6 are APG input/output terminals while pin 8~20 are system status signal terminals. See <i>Appendix A</i> for detail pin assignments. Note: This terminal is sensitive to ESD. Do not touch it during operation.
4	GPIB/ETHERNET Connector (Option)	The GPIB/ETHERNET bus used by remote controller is connected to PC via this connector for remote control.
5	RS-232C	It is a 9-pin 90° D type male connector. The control commands are transmitted between remote and PC for remote control.
6	RS-485	It is for serial or parallel data transmission use.
7	Label	The label has model no. and serial no. of DC Power Supply on it.
8	AC Power Connector	It inputs AC power through power line and connects to input stage through this connector.
9	Current Sharing Connector	It shares the output current equally when connecting in parallel and it has to be removed when connecting in series for use.
10	Fan Mask	Avoid touching the fan and do not block the fan mask to avoid accumulating heat inside the machine.
11	Functional Ground	This terminal is for user to refer to Earth Ground easily.
12	USB	The remote controller uses USB connector to connect to PC for remote operation.

Table 2 Description of Rear Panel

2. Installation

2.1 Checking the Package

- (1) Check if there is any damage or any missing accessories after unpacking it.
- (2) Should any damage is found, contact “Chroma RMA” immediately to request return shipment.
- (3) Besides this Quick Start Guide, please ensure the following accessories are received along with the instrument.

Accessories:

AC power cord with protective cover (not valid for model 62050P), manual CD, two network current sharing cables, two network system bus cables, output isolation hood, customized wrench (not valid for low, high voltage & model 62050P.) The package is shown as Figure 6.

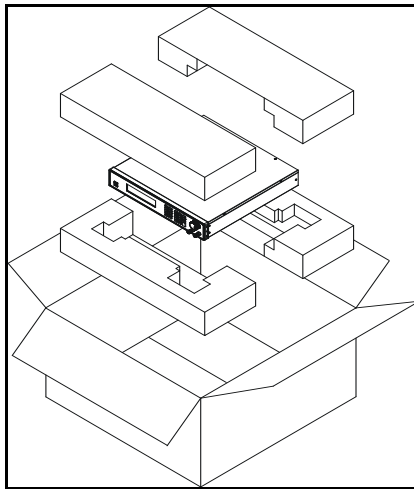


Figure 6

 Notice

1. Please keep all of the packing materials in case the device has to be returned for repair.
2. Do not return the instrument to the factory without obtaining prior RMA acceptance from Chroma.
3. Please check if the accessories in the packing list are all received.

2.1.1 Maintenance & Cleaning

Remove all connected wires and cables on the instrument before cleaning. Use a brush to clean the dust on it and if there are stains on the chassis that cannot be removed by brush, wipe it with volatile liquid (such as Cleaning Naphtha). Do not use any corrosive liquid to avoid damaging the chassis. Use a damp cloth with soap water or soft detergent to clean the LCD front panel. For internal cleaning, use a low-pressure air gun the dust inside or send it back to our agent for cleaning.

2.2 Preparation for Use

- (1) Be sure the Power Supply is connected to the AC line input that meets the specification.
- (2) The instrument must be installed in an air-circulated area to avoid the internal temperature getting too high.
- (3) The ambient temperature does not exceed 40°C.

2.2.1 Common Environment Conditions

- (1) In door use.
- (2) Altitude up to 2000m.
- (3) Temperature 5°C to 40°C.
- (4) Maximum relative humidity 80% for temperature up 31°C decreasing linearity to 50% relative humidity at 40°C.
- (5) Input AC supply voltage fluctuations can up to +-10% of the rated voltage.
- (6) Transient over voltage is impulse withstand CAT II. (**Note:** 62050P is CAT III.)
- (7) Pollution degree II.

2.3 Requirements of Input Power

2.3.1 Ratings

- (1) Model 62006P-xx-xx
Input Voltage Range : 95 ~ 250 Vac, single phase

Input Frequency : 47~ 63 Hz
Max. Input Power : 1000VA

(2) Model Model 62012P-xx-xx

Input Voltage Range : 95 ~ 250 Vac, single phase
Input Frequency : 47~ 63 Hz
Max. Input Power : 1700VA

(3) Model 62024P-xx-xx

Input Voltage Range : 190 ~ 250 Vac, single phase
Input Frequency : 47~ 63 Hz
Max. Input Power : 2900VA

(4) Model 62050P-xx-xx

Input Voltage Range : 190 ~ 250 V_{LL}, 3-phase 4-wire Δ
or 329 ~ 433 V_{LL}, 3-phase 5-wire Y
Input Frequency : 47~ 63 Hz
Max. Input Power : 6000VA
Max. Input Current(per phase):16A (3-phase 5-wire Y), 27A(3-phase 4-wire Δ)



CAUTION

1. If the input voltage is not within the range as described above, the output will shut down automatically to protect the DC Power Supply.
2. 62050P can connect 220 V_{LL} 3-phase 4-wire Δ and 380V_{LL} 3-phase 5-wire Y. Verify the power in use carefully before connection and select appropriate circuit breaker.

2.3.2 Input Connection

- (1) The input connector board is located at the right of rear panel.
- (2) The power line must be 85°C rated at least.
- (3) The power cable width must be within 10AWG~12AWG. (**Note:** 62050P must be within 8AWG ~10AWG when connecting 3-phase 4-wire Δ .)
- (4) To assemble 62006P, 62012P & 62024P ➡ see Figure 7 and execute the following steps:
 - a. Remove the input terminal safety cover from the rear panel of DC Power Supply.

- b. Scrape off the skin of power cable tip (the bare portion is about 1cm) and tin it.
- c. Insert the power terminal and secure it with a Phillips screwdriver.
- d. Lock the safety cover to avoid electric shock.
- e. Secure the safety cover latch to prevent the cable from falling or the electric terminal from exposing.

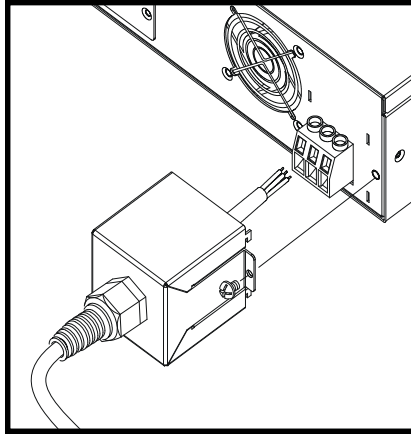


Figure 7



CAUTION

1. Connect the green or green/yellow metal wire to



terminal.

2. Connect the white or blue metal wire to "N" terminal.

3. Connect the black or brown metal wire to "L" terminal.

- (5) To assemble 62050P ➡ see Figure 8, Figure 9

- a. Remove the anti-pulling device and then insert the wires to pass through the anti-pulling device and safety cover as Figure 10 shows.
- b. Bend all of the wire terminals to 90° as Figure 11 shows.
- c. Install the 4 copper pillars on the rear panel and secure the power terminal on the input terminal socket with Phillips screws as well as the safety cover as Figure 12 shows to prevent from electric shock.
- d. At last secure the anti-pull device as Figure 13 shows.

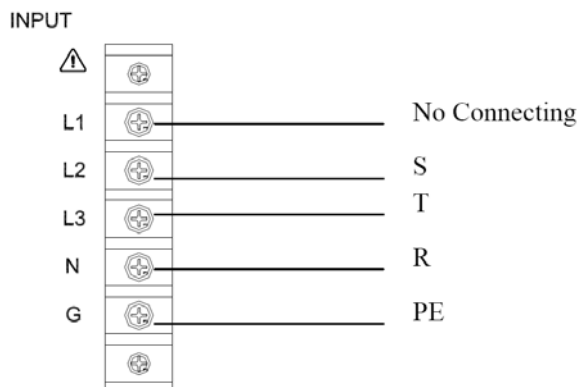


Figure 8 220V_{LL}, 3-phase 4-wire Δ Input Connection

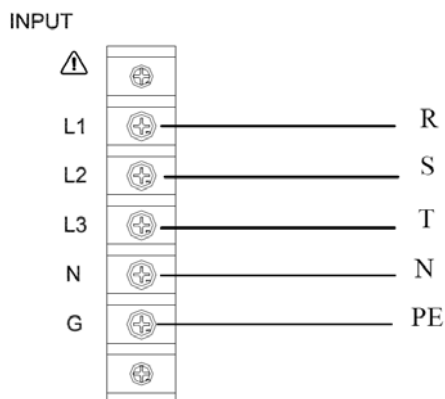


Figure 9 380V_{LL}, 3-phase 5-wire Y input connection

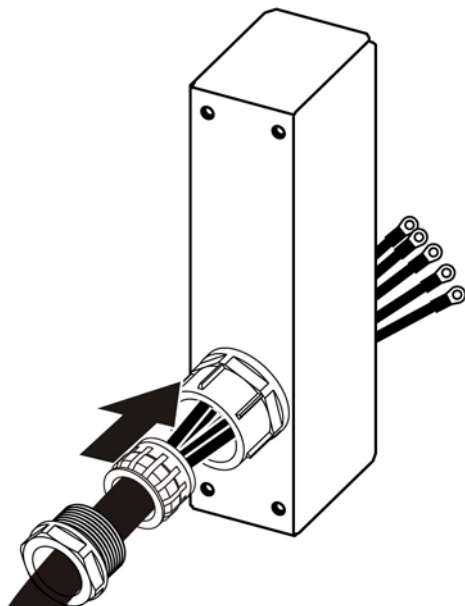


Figure 10 Assembling 62050P Input Terminal Safety Cover - 1

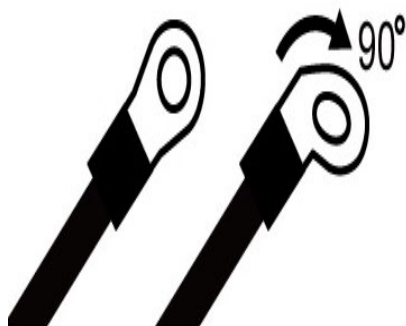


Figure 11 Assembling 62050P Input Terminal Safety Cover – 2

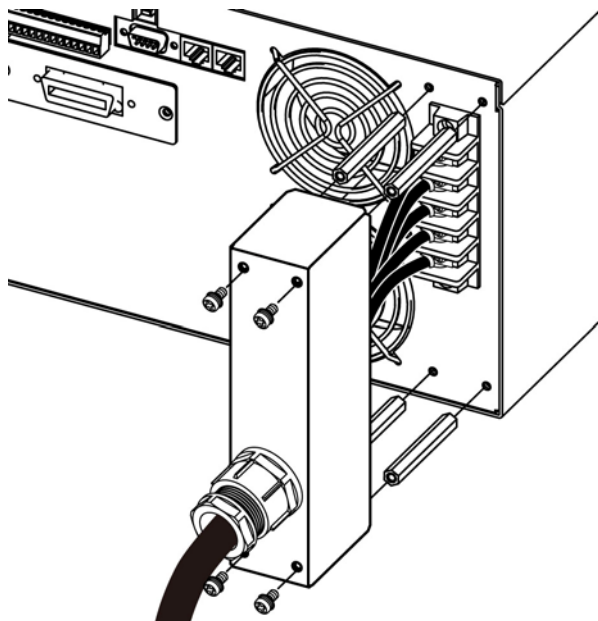


Figure 12 Assembling 62050P Input Terminal Safety Cover – 3

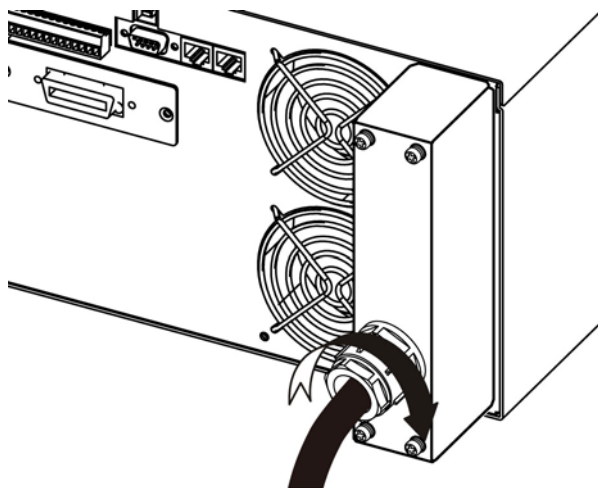


Figure 13 Assembling 62050P Input Terminal Safety Cover - 4

⚠ WARNING

1. To protect the operators, the wire connected to the GND terminal () must be connected to the earth. Under no circumstances shall this DC Power Supply be operated without an adequate ground connection.
2. Installation of the power cord must be done by a professional and compliant with local electrical codes.

2.4 Output Connection

62000P Series DC Power Supply has two output connectors; one is located at the left on the rear panel while the other one is located at the right on the front panel. The load is connected to “+” and “-” output terminal.



CAUTION

1. To meet the safety requirement, the safety cover must be tightly secured.
2. The diameter of the wire connected to load must be able to carry the maximum current applied.

2.4.1 Rear Panel Output

See Figure 14 and Figure 15..

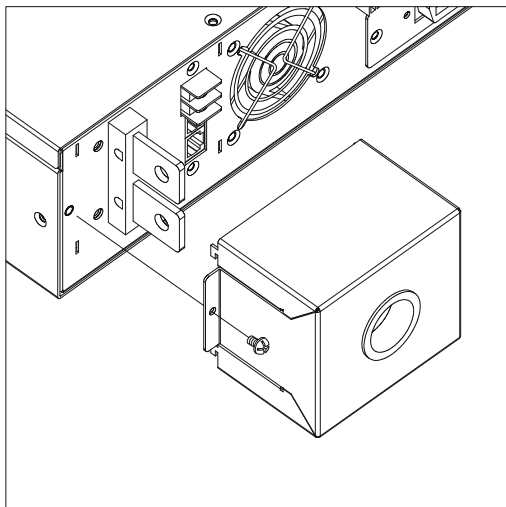


Figure 14 Assembling the Rear Safety Cover of 62006P, 62012P & 62024P

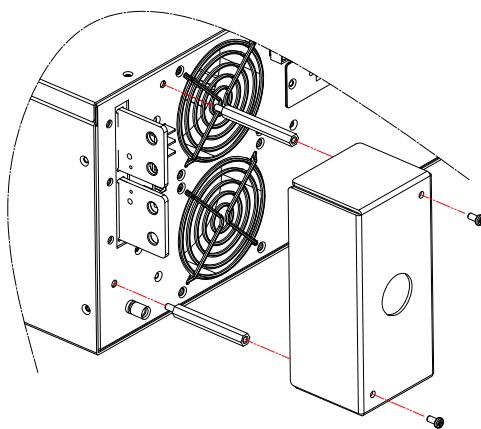


Figure 15 Assembling the Rear Safety Cover of 62050P

2.4.2 Front Panel Output

Except the models of low, high voltage and 62050P, the front panel maximum output current varies with the models of 62000P series. The connection is to unscrew the front panel terminal leftward with hand and then place the Y type terminal cable from the bottom of front panel terminal to make it touch the metal part of the load terminal tightly. Last, use the customized wrench to secure the connection as Figure 16 shows.

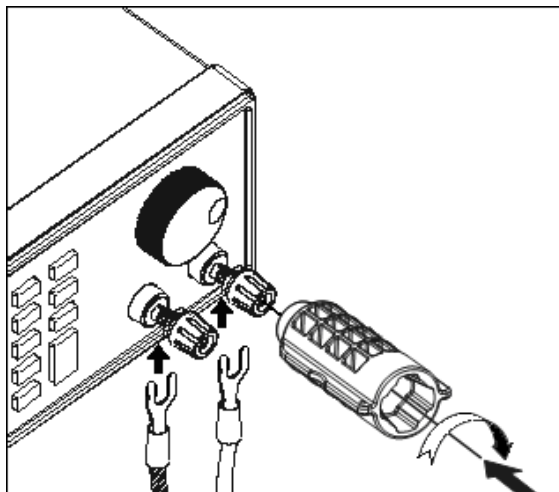


Figure 16

⚠ WARNING For safety reason, do not exceed rated current (different from 62000P Series) for the output current to avoid any danger.

★ Notice The maximum current for front panel output differs from 62000P Series models. The maximum current for front panel output can see table below.

Model	Max. Output Current (A)
62006P-100-25	25
62012P-80-60	60
62012P-100-50	50
62024P-80-60	60
62024P-100-50	50

2.4.3 Specification of Connecting Wire

The maximum output inductance of connecting wire to the source is $2\mu\text{H}$ (it is the total inductance of two wires after twisted or processed otherwise including self inductance and mutual inductance).

Notice

1. To ensure the system's stability, the cable inductance should not exceed $2\mu\text{H}$.
2. Do not use the wire with extra thin diameter to avoid overheating and causing hazard.



CHROMA ATE INC.

致茂電子股份有限公司

66 Hwaya 1st Rd.

Kuei-shan Hwaya Technology Park

Taoyuan County 33383, Taiwan

33383 台灣桃園縣龜山鄉

華亞科技園區華亞一路 66 號

T +886-3-327-9999

F +886-3-327-8898

Mail: info@chromaate.com

<http://www.chromaate.com>