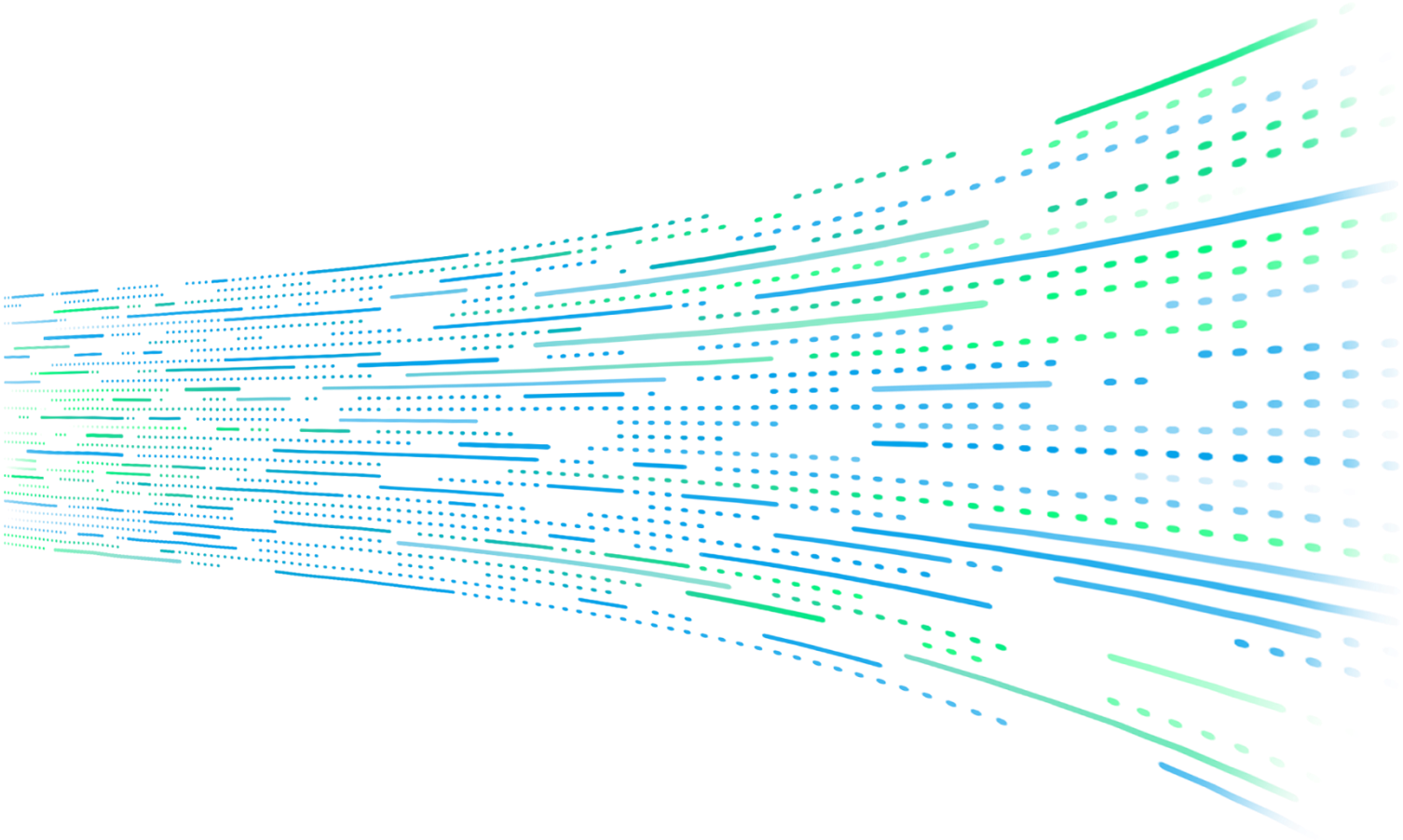
Chroma

Advancing Excellence

User's Manual

Single/Three Phase Switching Unit

A618005



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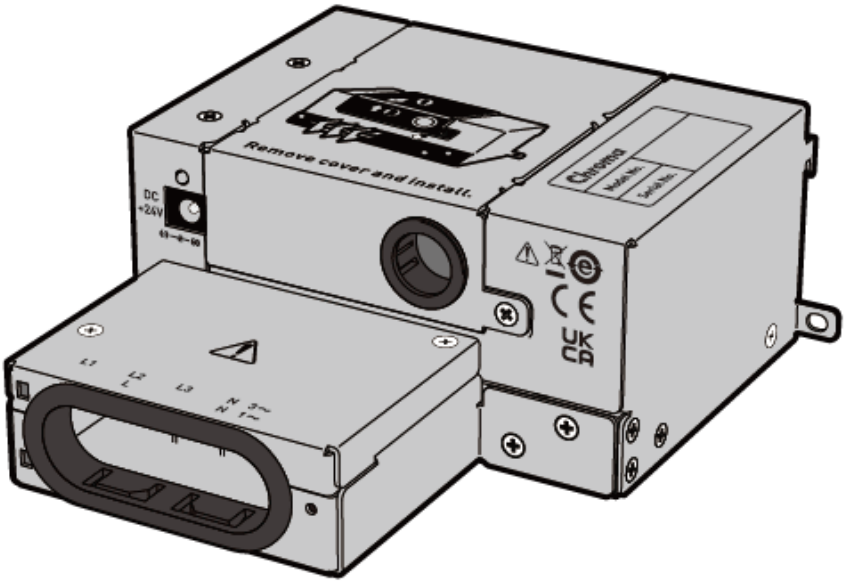

Version 1.0
April 2023

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The information in this document is subject to change without notice.

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CHROMA ATE INC.
88 Wenmao Rd., Guishan Dist., Taoyuan City 333001, Taiwan

Warranty

All of Chroma's instruments are warranted against defects in material and workmanship for a period of one year from the date of shipment. Chroma agrees to repair or replace any assembly or component found to be defective, under normal use during this period. Chroma's obligation under this warranty is limited solely to repairing any such instrument, which in Chroma's sole opinion proves to be defective within the scope of the warranty when returned to the factory or to an authorized service center. Purchaser is responsible for the shipping and cost of the service item to Chroma factory or service center. Shipment should not be made without prior authorization by Chroma.

This warranty does not apply to any products repaired or altered by persons not authorized by Chroma, or not in accordance with instructions furnished by Chroma. If the instrument is defective as a result of misuse, improper repair, or abnormal conditions or operations, repairs will be billed at cost.

Chroma assumes no responsibility for its product being used in a hazardous or dangerous manner either alone or in conjunction with other equipment. High voltage used in some instruments may be dangerous if misused. Special disclaimers apply to these instruments. Chroma assumes no liability for secondary charges or consequential damages and in any event, Chroma's liability for breach of warranty under any contract or otherwise, shall not exceed the purchase price of the specific instrument shipped and against which a claim is made.

Any recommendations made by Chroma regarding the use of its products are based upon tests believed to be reliable; Chroma makes no warranty of the results to be obtained. This warranty is in lieu of all other warranties, expressed or implied, and no representative or person is authorized to represent or assume for Chroma any liability in connection with the sale of our products other than set forth herein.

Chroma undertakes no liability for any special or consequential damages, or any of our customer's compensation responsibilities to third parties, arising from use or access of our product.

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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	Selected Phthalates Group
	Pb	Hg	Cd	Cr^{6+}	PBB/PBDE	DEHP/BBP/DBP/DIBP
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, EU Directive 2011/65/EU, and 2015/863/EU.

“×” indicates that the level of the specified chemical substance exceeds the threshold level specified in the standards of SJ/T-11363-2006, EU Directive 2011/65/EU, and 2015/863/EU.

Remarks:
1. The CE marking on the product is a declaration of product compliance with EU Directive 2011/65/EU and 2015/863/EU.
2. This product is complied with EU REACH regulations and no SVHC is in use.

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 ones, the retailer is legally obligated to take back your old appliances for disposal at least free of charge.

<Table 2>

Part Name	Hazardous Substances					
	Lead	Mercury	Cadmium	Hexavalent Chromium	Polybrominated Biphenyls/ Polybromodiphenyl Ethers	Selected Phthalates Group
	Pb	Hg	Cd	Cr^{6+}	PBB/PBDE	DEHP/BBP/DBP/DIBP
PCBA	×	O	O	O	O	O
CHASSIS	×	O	O	O	O	O
ACCESSORY	×	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, EU Directive 2011/65/EU, and 2015/863/EU.

"×" indicates that the level of the specified chemical substance exceeds the threshold level specified in the standards of SJ/T-11363-2006, EU Directive 2011/65/EU, and 2015/863/EU.

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.
3. This product is complied with EU REACH regulations and no SVHC is in use.

Disposal

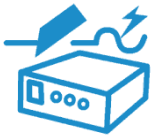
Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater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

Safety Summary

The following general safety precautions must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or specific WARNINGS given elsewhere in this manual will violate the 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 device.

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 the 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. The instrument should be used in an environment of good ventilation.

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 the explanation in the manual.
	**High temperature:** This symbol indicates the temperature is hazardous. Do not touch to avoid personal injury.
	**Protective grounding terminal:** This symbol indicates that the terminal must be connected to the ground before operating the equipment to protect against electrical shock in case of a fault.
	**Functional grounding:** To identify an earth (ground) terminal in cases where the protective ground is not explicitly stated. This symbol indicates the power connector does not provide grounding.
	**Frame or chassis:** To identify a frame or chassis terminal.
	**Alternating Current (AC)**
	**Direct Current (DC) / Alternating Current (AC)**
	**Direct Current (DC)**
	**Push-on/Push-off power switch**
	The **WARNING** sign highlights an essential operating or maintenance procedure, practice, condition, statement, etc., which if not strictly observed, could result in injury to, or death of, personnel or long term health hazards.
	The **CAUTION** sign highlights an essential operating or maintenance procedure, practice, condition, statement, etc., which if not strictly observed, could result in damage to, or destruction of, equipment.
	The **Notice** sign highlights an essential operating or maintenance procedure, condition, or statement.

Table of Contents

1. Overview

1.1 Introduction

Previously, it was necessary to manually short-circuit the three-phase via an external copper bar to attain the single-phase mode on the 61800 & 63800R series. To make the operation more convenient for users, the A618005 can be paired with the above series models to rapidly switch the phase through TTL controlling the single/three-phase signals. Thus, there is no need to manually short-circuit the copper bars for a three-phase parallel connection.

1.2 Features

- Voltage specification: 0~350V
- Frequency: DC, 30Hz~100Hz
- An energy recharge function provides 100% reverse-rated current recharge capability.
- Comply with PV inverter, Smart Grid, and EV-related products test applications
- Optional single/three-phase AC output

1.3 Specification

The operating specifications of A618005 paired with the 61800 and 63800R series models are listed in the table below. All specifications are tested by Chroma's standard test procedure. Unless otherwise specified, all specifications are tested under the conditions of connecting a remote voltage sense with a test temperature of 25±1°C and a resistive load.

Model	A618005
Operating Mode	**Single/Three-Phase Mode**
AC Output Rating	
Single-phase mode power	15kVA
Three-phase mode total power	15kVA
Power per phase	5kVA
Voltage	
Output voltage	0~350V_{LN}
Accuracy[*1]	0.1%+0.2%F.S.
Resolution	0.1 V
Distortion[*1*2]	< 0.5% @50/60Hz < 0.8% @30Hz~100Hz
Voltage regulation	0.10%
Load regulation[*3]	0.20%
Max. Current (Single-phase mode)	
Output current (RMS)	105A
Output current (Peak)	315A
Max. Current (Three-phase mode/ per phase)	
Output current (RMS)	35A@142.85V (maximum CP)

Output current (Peak)	105A
Frequency	
Range	DC, 30Hz ~ 100Hz
Accuracy	0.01%
Resolution	0.01Hz
DC Output Rating (Single-phase mode)	
Power	15kW
Voltage	495V
Current	78.75A
DC Output Rating (Three-phase mode/ per phase)	
Power	5kW
Voltage	495V
Current	26.25A
Dimension (W×D×H)	152.3 x 165.62 x 62(mm)
Weight	1.4kg / 3.08 lbs
Safety & EMC	CE (including EMC & LVD)

Note
*1: The voltage, frequency accuracy and maximum distortion test uses Power Analyzer Line Filter=6kHz, Update rate=500ms for measurement on linear load. The reference model is Chroma 66204.
*2: The maximum distortion test is the maximum output power to a linear load when the output voltage is set to 350VAC.
*3: The condition of load regulation is to set the sine wave output.

1.3.1 Front Panel

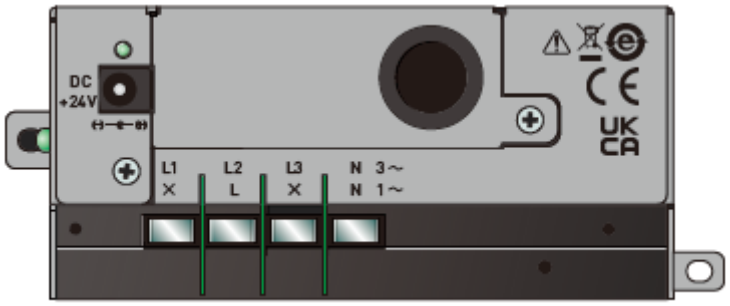


Figure 1-1 Front Panel

1.3.2 Rear Panel

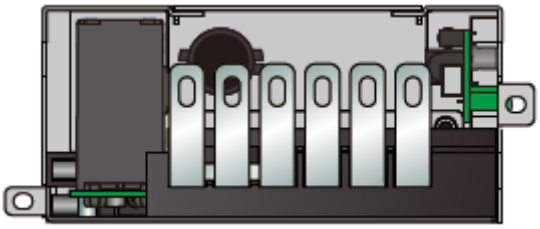


Figure 1-2 Rear Panel

2. Connecting Single/Three Phase Switching Unit

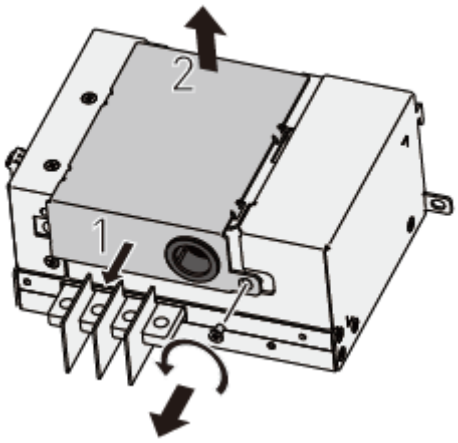
2.1 Connecting A618005 to Regenerative Grid Simulator/ Regenerative AC Electronic Load

The A618005 needs to be paired with the 61800 and 63800R series models for use. The connection of input and output terminals as well as control signals are described as follows.

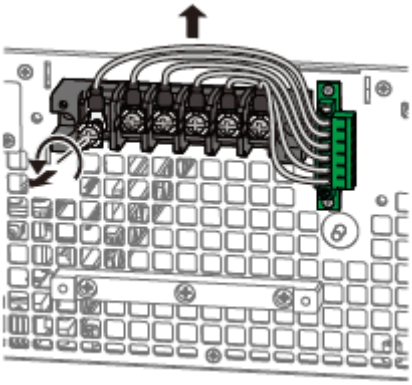
2.1.1 Connection of Input Terminal

The 61800 and 63800R series models can use the following methods to connect the A618005. Connect the output terminal of the Regenerative Grid Simulator/Regenerative AC Electronic Load to the input terminal of A618005, the connection diagram is shown below.

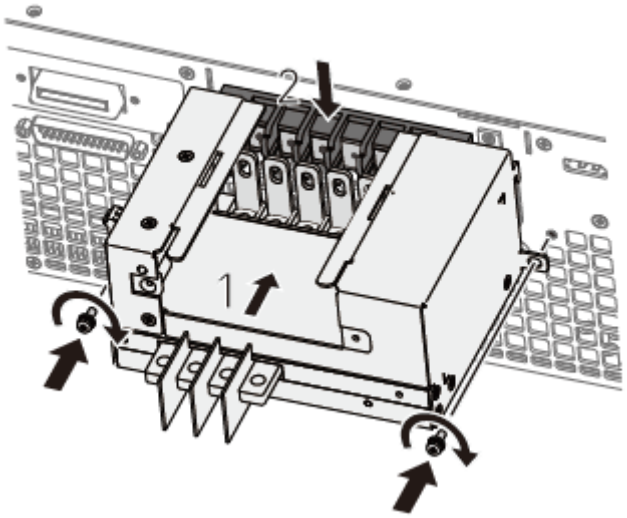
Step1



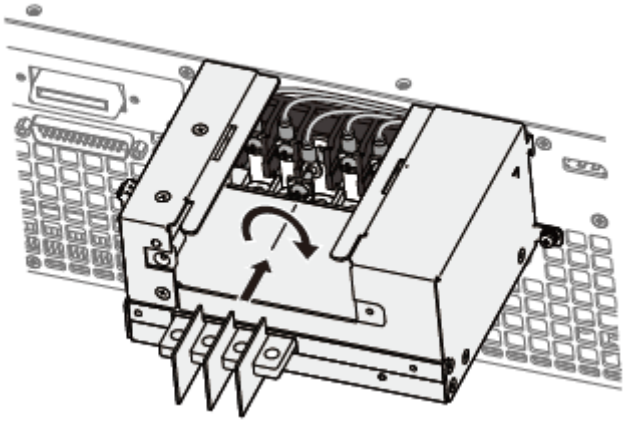
Step2



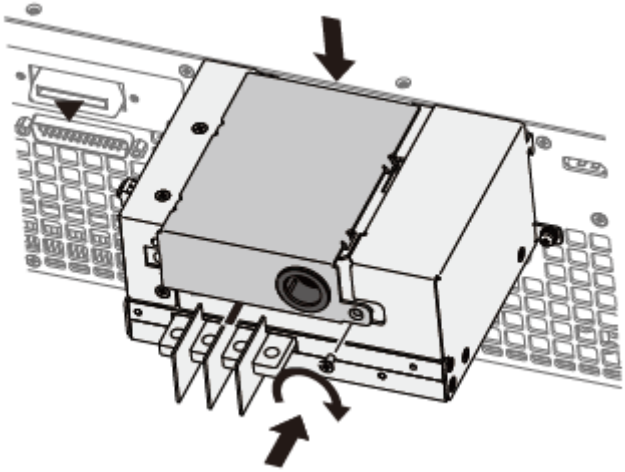
Step3



Step4

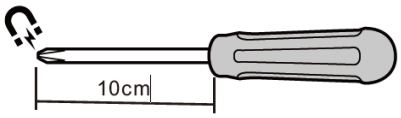


Step5

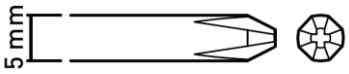


Notice

1. Please use a magnetic screwdriver with a length of 10 cm.



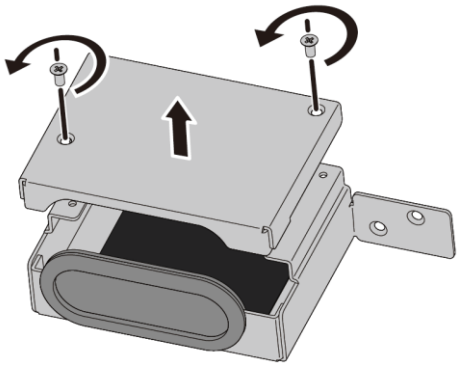
2. Please use a Phillips screwdriver with a diameter of 5mm.



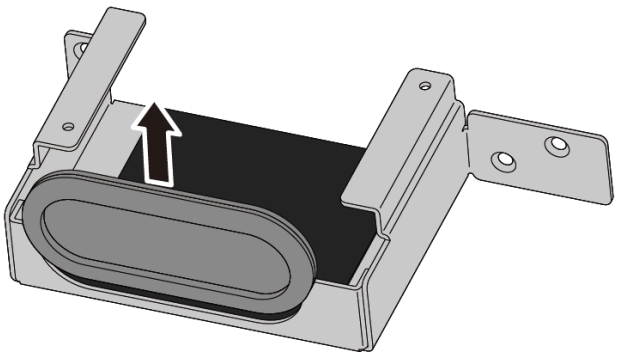
2.1.2 Connection of Output Terminal

For the connection between the A618005 and the DUT, please refer to the description in the figures below.

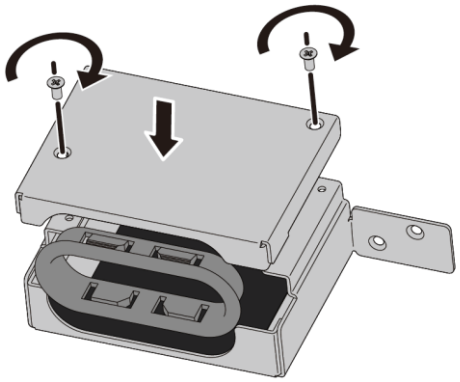
Step1



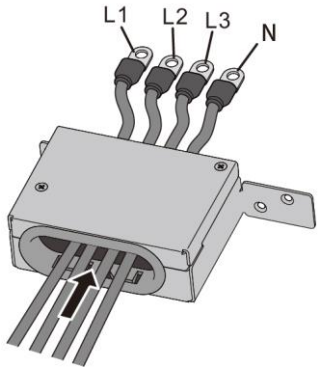
Step2



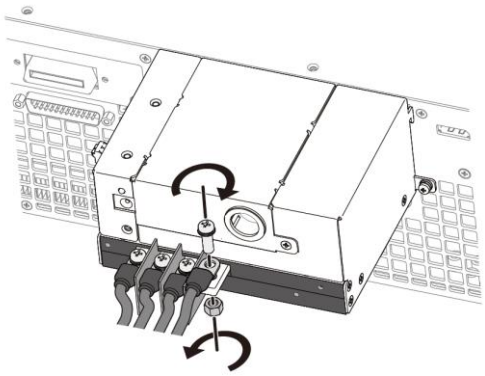
Step3



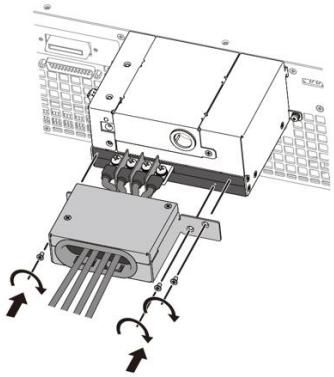
Step4



Step5



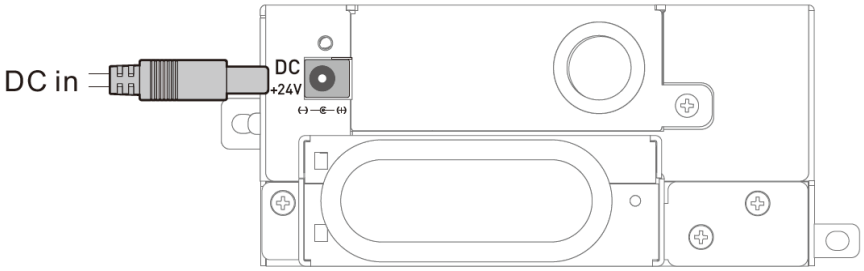
Step6



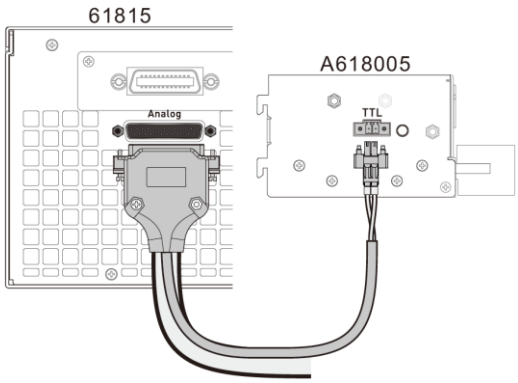
2.1.3 Connection of Control Signal

Before starting the A618005, it is necessary to use an external power supply and a TTL signal cable of the 61800 and 63800R series to connect the A618005 first. The diagrams for connection are shown below.

Step1



Step2



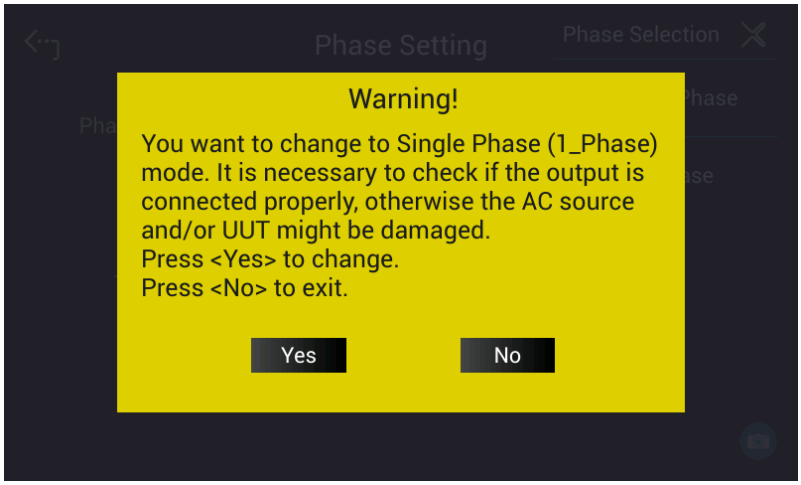
⚠WARNING

1. The specification of the power supply is +24V input. Do not change it arbitrarily to avoid damage.
2. When installing or maintaining, be sure to turn off the power to avoid personal injury.

2.2 Switching Method

The single or three-phase mode switch on the A618005 is specified by the 61800 and 63800R series. When a single phase is required, the user can acquire it by setting the 61800 and 63800R series to a single phase. Select Configuration from the menu in the upper left corner to enter the Phase Setting menu. Set to 1_Phase Mode when entering the 1_Phase Mode/3_Phase Mode switching function.

1. Press the Phase Selection indicator.
2. Select “Single Phase” mode.
3. Make sure the output connection is in Single Phase mode and click Yes to confirm the change.



Notice

1. When switching the Single/Three phase mode, the user set output will be reset to zero to avoid damaging the DUT.
2. The system version of the 61800 and 63800R series must be at least 1.05 to be used with A618005. If the version is older, please contact the local technical service personnel of Chroma.
3. This switching unit can output in Single or Three Phase mode. When set to Single Phase mode, the internal relay will lead L1 and L3 to L2 (note that at this time, the L1 and L3 terminals will still be charged when outputting). Therefore, in single-phase mode, the user is allowed to short-circuit the output terminal L1/L2/L3 on the DUT or connect the L2/N points to the DUT. Be aware that for this connection, the cable diameter connected to the DUT must be sufficient to withstand current.

⚠WARNING In the output state, please do not remove the power supply and TTL signal cable at will to avoid damage.

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