GWINSTEK Three Phase Power Controller ASR-002 User Manual

GWINSTEK

Three-Phase Power Controller
ASR-002
USER MANUAL
Rev. A

ISO-9001 CERTIFIED MANUFACTURER

Contents

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-002 or to otherproperties.
⚡	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

⚠ CAUTION
- Do not place any heavy objects on the ASR-002.
- Avoid severe impact or rough handling that leads to damaging the ASR-002.
- Do not discharge static electricity to the ASR002.
- Use only mating connectors, not bare wires, for the terminals.

- Do not block the cooling fan opening.
- Do not disassemble the ASR-002 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.

⚠ WARNING   **Power Supply**

- AC Input voltage range:

  230 Vac ± 15%
- Frequency: 50/60 Hz
- To avoid electrical shock connect the protective grounding conductor of the AC power cord to

  an earth ground.

Cleaning the ASR002

- Disconnect 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
Storage environment	- Location: Indoor - Temperature: -10°C to 70°C - Relative Humidity: ≤90%, no condensation
Disposal	Do not dispose of 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-002 power controller in a nutshell, including its main features and front/rear panel introduction.
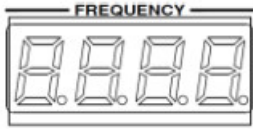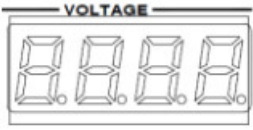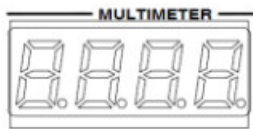
ASR-002 Overview

ASR-002, which is a three-phase power controller, is able to control up to 3 single-phase power supply units (ASR series only). It effectively makes AC output conformed to 1P3W/3P4W that generally unit requires, and also turns output into 3P3W via designated wire method. When the select single-phase power is greater than the capacity of 2kVA, it is suggested that output should be connected to an external terminal for safety consideration.

Front Panel
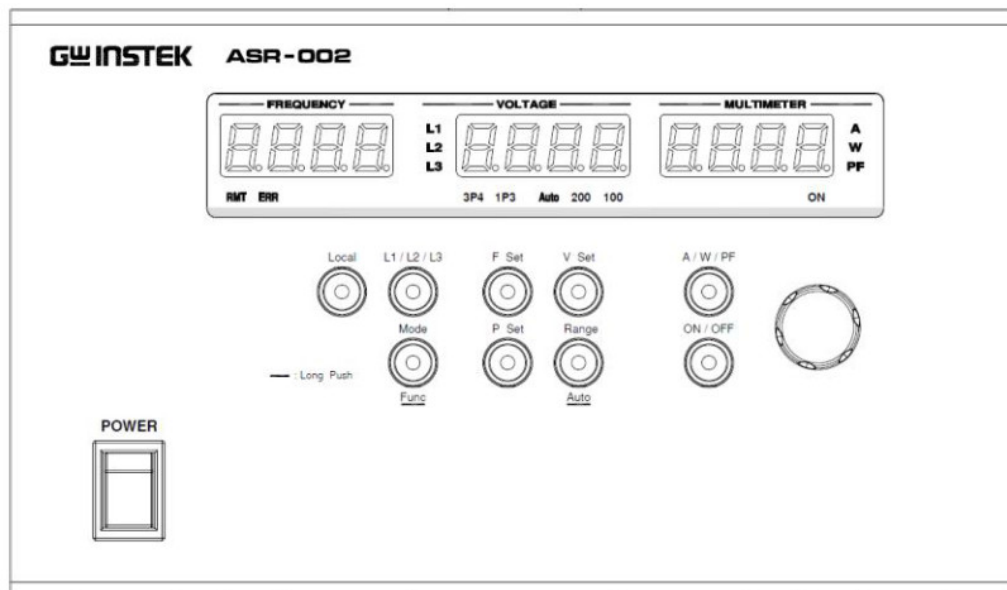
Section	Figure	Description
Header Displays	FREQUENCY	FREQUENCY: It displays frequency.
	VOLTAGE	VOLTAGE: It displays voltage.
	MULTIMETER	MULTIMETER: It displays A current / W power / PF power factor.
Function Keys	A / W / PF	It changes header display A → W → PF.
	ON / OFF	ON: Output on. OFF: Output off.

V Set	V Set: It configures voltage.
Range / Auto	Range: It toggles between 100V and 200VAuto: It enters Auto range by long press.
F Set	F Set: It configures frequency.
P Set	P Set: It configures L2 / L3 phase.
L1 / L2 / L3	L1 / L2/ L3: It changes among L1 → L2 →L3.
Mode / Func	Mode: It toggles between 1P3W → 3P4W. Func: It configures advanced settings by long press.
Local	Local: It cancels connection and enters the local opeation mode.
Knob Key	Knob Key: It adjusts value by scroll. Also, it switches input adjusting position by press.
Display Icons RMT	It indicates remote control mode.
ERR	It indicates that error of control occurs.
L1 L2 L3	It indicates output phase.
3P4 1P3	It indicates output mode.
Auto 200 100	It indicates output range.
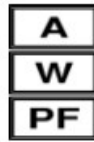
It indicates measurement unit display.

Rear Panel
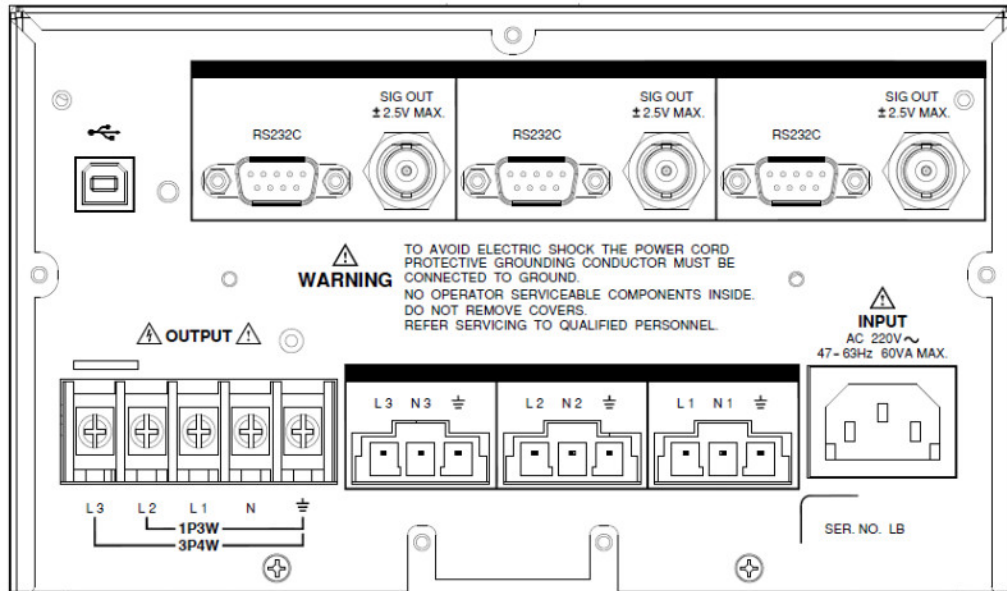
Section	Figure	Description
USB Port		USB B-type port for remote control.
RS232C Port		RS232C port for remote control.
SIG OUT		SIG OUT for phase control signal output.
Phase Terminal		The phase terminals for L1/L2/L3.
Output Terminal		1P3W: Single phase 3 wire. 3P4W: Three-phase 4 wire.
Power Voltage Input		Voltage Input: AC 220V. Power Frequency: 47 – 63Hz.

OPERATION

Basic Operation
Output Mode Setting Process
Steps 1. Press the Mode key.
2. Toggle between 1P3W →3P4W.
Voltage Range Setting Process
Steps 1. Press the Range key.
2. Toggle between 100V →200V.
Press and hold the Range key to enter Auto.
Voltage Value Setting Process
Steps

1. Press the V Set key.

2. Scroll the Knob key to adjust voltage value.

3. 100V: 0 – 175V

    200V: 0 – 350 V

    Auto: 0 – 350V

4. After adjustment, press the V Set key again to

    upload the set value to ASR series unit.

Frequency Setting Process

Steps

1. Press the F Set key.
2. Scroll the Knob key to adjust frequency value.
3. Frequency range: 40 – 999.9Hz.

Phase Shift Setting Process

Steps

1. Press the P Set key.
2. Scroll the Knob key to adjust phase.L2 setting range: 85° – 155°.

$$\boxed{P\;\mathsf{5}\;E\;\mathsf{t}}\;\boxed{\mathit{120.0}}\;\boxed{\mathit{0.00}}$$

3. Press the P Set key to enter the next step. L3 setting range: 205° – 275°.

$$\boxed{P\;\mathsf{5}\;E\;\mathsf{t}}\;\boxed{\mathit{240.0}}\;\boxed{\mathit{0.00}}$$

4. Press the P Set key to exit.

Advance Setting
Voltage Amplification Setting Process
Steps

1. Press and hold the Mode key to enter the setting.
2. Adjust L1/L2/L3 based on voltage amplification.
3. Scroll the Knob key to adjust amplification. The setting range: 0 – 3.5. Press L1/L2/L3 key to

   enter next step.

$$\boxed{L\;\mathit{1}}\;\boxed{\mathsf{U}\;\mathsf{r}\;E\;F}\;\boxed{\mathit{1.000}}$$
$$\boxed{L\;\mathit{2}}\;\boxed{\mathsf{U}\;\mathsf{r}\;E\;F}\;\boxed{\mathit{1.000}}$$
$$\boxed{L\;\mathit{3}}\;\boxed{\mathsf{U}\;\mathsf{r}\;E\;F}\;\boxed{\mathit{1.000}}$$

4. After configuration, press the Range key to enter the next step.

RS232 Baudrate Setting Process
Steps
1. RS232 interface transmission speed setting (9600 by default). Setting range: (9600 → 19200   38400   57600 →115200).

$$\boxed{b\;\mathsf{R}\;U\;d}\;\boxed{}\;\boxed{\mathit{9600}}$$

Factory Default Setting Process
Steps

1. Restore to the factory default setting. Press the Range key, and the system exits automatically.

$$\boxed{F\;\mathsf{R}\;C\;\mathsf{t}}\;\boxed{d\;E\;F\;\mathsf{R}}\;\boxed{}$$

Slew Rate Setting Process
Steps

1. Slew Rate setting. Setting range: 0.001 – 0.5.

`5LEU` `rAtE` `0.200`

2. After configuration, press the Range key to enter the next step.

Phase Angle Setting Phase Angle Setting Process Steps

1. Press and hold the P Set key to enter the phase angle setting.
2. Set the starting angle.
3. The default setting is OFF.

`on` `PHA5` `oFF`

4. Press the Range key to enter next step or scroll the Knob key to adjust to ON for angle setting. The setting range: 0° – 359°.

`on` `PHA5` `on`

5. Press the Range key to enter the next step and exit from starting angle setting.
6. Set the ending angle.
7. The default setting is OFF.

`oFF` `PHA5` `oFF`

8. Press the Range key to finish the phase angle setting or scroll the Knob key to adjust to ON for angle setting. The setting range: 0° – 359°.

`oFF` `PHA5` `on`

9. After configuration, press the Range key to finish phase angle setting.
10. Press and hold the Mode key and display will be shown as the right figure.
11.

`5AUE` `FUnC` `5Et`

12. Press the Range key to save the setting and exit.

Voltage Ramp Setting
Voltage Ramp Setting Process
Steps

1. Press and hold the V Set key to enter the Ramp setting.
2. The default setting is OFF.

`UoLt` `rAnP` `oFF`

3. Press the Range key to exit from Ramp setting or scroll the Knob key to Ramp ON

   followed by pressing Range key to enter the Ramp value setting.4. The setting range: 0.001 – 9.999

`UoLt` `rAnP` `on`

4. The setting range: 0.001 – 9.999
5. Press the Range key to exit.
6. Press and hold the Mode key and display will be shown as the right figure.
7.

`SAVE` `FUNC` `SET`

Press the Range key to save the setting and exit.

Frequency Sweep Setting
Frequency Sweep Setting Process

Steps
1. Press and hold the F Set key to enter the Sweep setting.
2. The default setting is OFF.

`FrEQ` `SWEP` `oFF`

3. Scroll the Knob key to Sweep ON followed by pressing the Range key to enter the Sweep value setting.
4. The setting range: 0.001 – 9.999
5. Press the Range key to exit.
6. Press and hold the Mode key and display will be shown as the right figure.

`FrEQ` `SWEP` `on`

7. Press the Range key to save the setting and exit.
Unit Setting Value Display
Unit Setting Value Display Setting Process

Steps	1. Press and hold the Mode key to enter the setting.	
	2. Press the L1/L2/L3 key to browse the default settings as follows.	
	L1 Vref 1.000	`L1` `VrEF` `1000`
	L2 Vref 1.000	`L2` `VrEF` `1000`
	L3 Vref 1.000	`L3` `VrEF` `1000`
	SLEW RATE 0.200	`SLEW` `rAtE` `0200`
	BAUD 9600	`bAUd` `9600`
	FACT DEFA	`FACt` `dEFA`
	SOFT VER T101	`SoFt` `VEr` `t101`
	SAVE FUNC SET	`SAVE` `FUnC` `SEt`
	EXT ASR SET	`EXt` `ASr` `SEt`
	EXIT FUNC SET	`EXIt` `FUnC` `SEt`

Wire Connection & Accessories
ASR-2000 Series Example
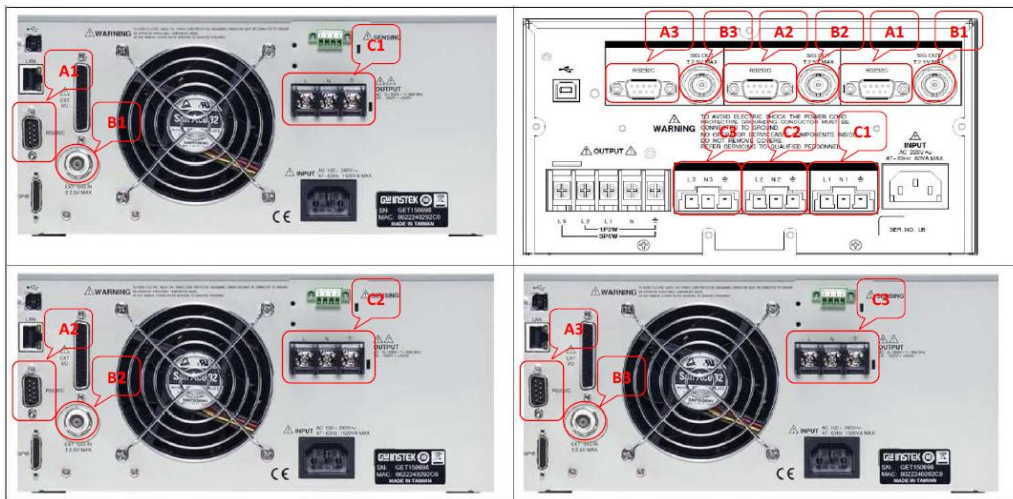
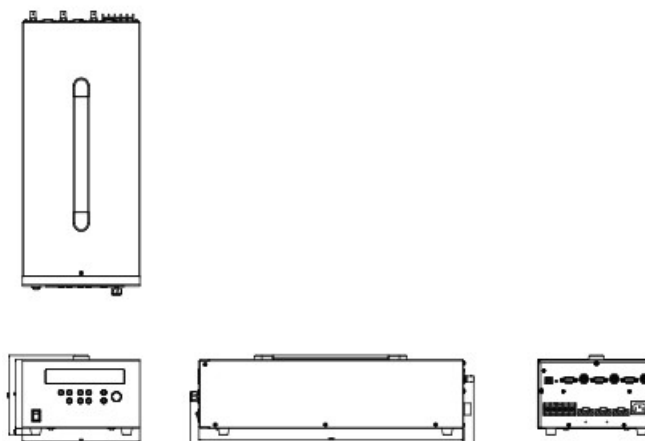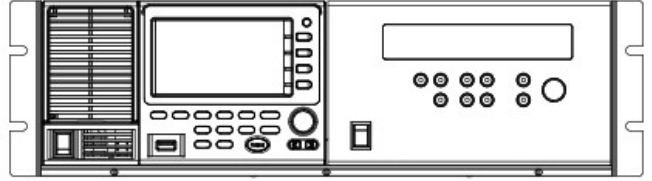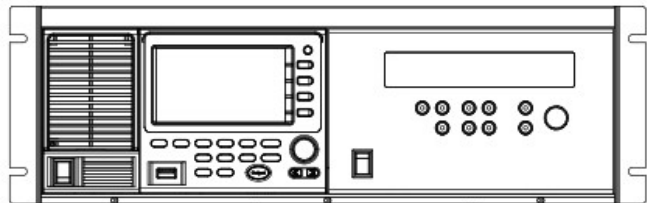| ASR-2100 A1 to ASR-002 A1 | B1 to B1 | C1 to C1 |
| ASR-2100 A2 to ASR-002 A2 | B2 to B2 | C2 to C2 |
| ASR-2100 A3 to ASR-002 A3 | B3 to B3 | C3 to C3 |

Accessories

Part Number	Description
GTL-232 x 3	RS232C cable, approx. 2M
GTL-110 x 3	BNC test lead, approx 1.1M
GTL-246 x 1	USB Cable (USB 2.0 Type A- Type B Cable, Approx. 1.2M)
40WC792030011 x 3	C1/C2/C3 Cable, 4M Max Length, UL1015 12AWG, RV5-5, Hirose DF22-4S- 7.92C(28) 3P + DF22A-1012SCFA

APPENDIX

ASR-002 Dimension

Using the Rack Mount Kit

Background	The ASR-002 assembled with ASR-2000 has thefollowing optional Rack Mount kits.
ASR-002 Rack-EIA	
ASR-002 with ASR2000 assembled with rack EIA	
ASR-002 Rack-JIS	
ASR-002 with ASR2000 assembled withrack JIS	
⚠ CAUTION	Ensure adequate ventilation is provided when using the rack mount. Ensure that a gap is given for air intakes. Failure to do so may cause theinstrument to overheat.

Command List
Source Commands
[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]
[SOURce:]VOLTage[:LEVel][:IMMediate][:AMPLitude]?
[SOURce:]VOLTage:RANGe 100/200/AUTO
[SOURce:]VOLTage:RANGe?
[SOURce:]VOLTage:MODE FIXed/STEP
[SOURce:]VOLTage:MODE?
[SOURce:]VOLTage:SLEW xxx
[SOURce:]VOLTage:SLEW?
[SOURce:]FUNCtion[:SHAPe][:IMMediate] SIN/SQU/TRI
[SOURce:]FUNCtion[:SHAPe][:IMMediate]?
[SOURce:]FREQuency[:IMMediate] xxx
[SOURce:]FREQuency[:IMMediate]?
[SOURce:]PHASe:PHASe L12,xxx/L13,xxx
[SOURce:]PHASe:PHASe? L12/L13
[SOURce:]PHASe:STARt:ENABle ON/OFF/1/0
[SOURce:]PHASe:STARt:ENABle?
[SOURce:]PHASe:STARt xxx
[SOURce:]PHASe:STARt?
[SOURce:]PHASe:STOP:ENABle ON/OFF/1/0
[SOURce:]PHASe:STOP:ENABle?
[SOURce:]PHASe:STOP xxx
[SOURce:]PHASe:STARt?
Output Commands OUTPut[:STATe] ON/OFF/1/0 OUTPut[:STATe]?
Display Commands DISPlay[:WINDow]:INSTrument:NSELect 0/1/2
DISPlay[:WINDow]:INSTrument:SELect L1/L2/L3
Measure Commands MEASure[:SCALar]:FREQuency?
MEASure[:SCALar]:CURRent[:RMS]?
MEASure[:SCALar]:CURRent:AVErage?
MEASure[:SCALar]:VOLTage[:RMS]?

MEASure[:SCALar]:VOLTage:AVErage?
MEASure[:SCALar]:POWer[:AC][:REAL]?
MEASure[:SCALar]:POWer[:AC]:APParent?
MEASure[:SCALar]:POWer[:AC]:REACtive?
MEASure[:SCALar]:POWer[:AC]:PFACtor?
System Commands SYSTem:ERRor?
SYSTem:CONFigure:NPU 3P4W/1P3W
SYSTem:CONFigure:NPU?
Common Commands *IDN?
*CLS
*RST

ASR-002 Error Messages

The following error messages may appear on the ASR-002 screen display during varied operations.

Section	Error Messages	
Command Error	0	"No error"
	-101	"Invalid character"
	-102	"Syntax error"
	-103	"Invalid separator"
	-108	"Parameter not allowed"
	-109	"Missing parameter"
	-113	"Undefined header"
	-121	"Invalid character in numb"
	-148	"Character data not allowed"
	-151	"Invalid string data"
Execution Error	-203	"Command protected"
	-222	"Data out of range"
	-224	"Illegal parameter value"
Device-Specific Error	-330	"Self-test failed"
	-350	"Error queue overflow"
Query Error	-410	"Query INTERRUPTED"
	-420	"Query UNTERMINATED"
	-521	"Input buffer overflow"
	-522	"Output buffer overflow"

Documents / Resources

GWINSTEK Three Phase Power Controller ASR-002 [pdf] User Manual
GWINSTEK, Three Phase, Power, Controller, ASR-002