DENRYO

DIASINE®

Sine Wave Power Inverter
GD150/GD300 Series 200V Model
User's Manual

RoHS CE

Ver.1.04E

Table of Contents

1. Safety Instructions

This document contains important safety and operating information for DIASINE®. To work DIASINE® the best, use inverter only as described in safety instructions. Carefully read through the safety instructions before mounting DIASINE®.

⚠ WARNING	This sign indicates the following contents includes important information. The wrong order of handling may lead to the risk of death or seriously injured.

⚠ CAUTION	This sign indicates the following contents includes important information. The wrong order of handling may cause damage to the products and the surrounding stuff.

☞ MEMO	This sign indicates the following contents includes important information of manuals about functions which contains safety instructions or proper operation of DIASINE®.

Precautions During Installation

- Installation and operation of DIASINE® should be performed by personnel knowledgeable about proper safety precautions.
- To avoid the risk of electric shock and fire, read and adhere to electrical wiring regulations. Do not disassemble DIASINE®.
- To avoid the risk of electric shock and fire, install DIASINE® out of reach of the children.
- Do not expose DIASINE® to rain, snow, dust or under high humidity environment.
- Do not install DIASINE® under high temperature environment, near fire, or under sun exposure directly.
- DIASINE's temperature might rise during operation. Be careful when moving or removing it.
- To avoid covering or obstructing the ventilation openings, do not put any objects within 15 cm area near inverter.
- To avoid overheating, do not put any stuff on it.
- To connect more than one battery, use same model battery from the same manufacturer. Using different batteries simultaneously is dangerous.
- Batteries generate explosive gases when discharge. Never smoke or light fire near battery.
- DIASINE® contains components might produce arcs or sparks. To prevent fire or explosion, do not install in compartments with batteries or flammable materials.

⚠ CAUTION	Since battery deteriorates over time, maintenance on a yearly basis is recommended. Change deteriorated batteries to prevent the hazard of fire.

Do Not Disassemble

Keep Dry

Danger High Temperature

No Open Flame

Do Not Stack

Keep Air Ventilation

2. General Information

DIASINE® is pure sine wave inverter that converts DC voltage to AC sine wave voltage. The output waveform is as same as sine wave of commercial power supply. The total harmonic distortion is less than 3%. High efficiency circuit and switching control achieved 90% efficiency at full rated load. DIASINE® is downsized presented by fanless structure, cools down by natural convection, which enables it to operate quietly. Moreover, DIASINE® is equipped with various protective functions. Even input polarity is reversed, the internal circuit will not be damaged. Moreover, with capability of inputting wide voltage range, operating under wide temperature range and remote control function, DIASINE® can be used in various environments and applications.

Features

- Input reverse polarity protection by internal circuit
- Fanless quiet operation (natural convection)
- Wide operating temperature (-20~+60°C)
- Output voltage/frequency easily switchable by button
- Pure sine wave output (total harmonic distortion less than 3%)
- Light weight and slim design
- High efficiency (90% at full rated load)
- Built-in remote-control function
- Various protective circuit: Input voltage warning, shut down, input reverse polarity, output voltage, output short-circuit, overload and over temperature
- Buzzer ON/OFF, LED brightness switchable
- Low power mode and sleep mode setting
- Wide input voltage
- Input voltage of 12V/24V/48V by 3 lineups
- Input terminal cover for dust prevention
- Optional communication function (T. B. D.)

Block Diagram

Safety and EMC Certified

Safety standards :EN62368-1: 2014+A11:2017
Immunity standards :EN55024:2010
Emission standards :EN55032:2012

3. Inverter Features

3-1 Specification

MODEL		GD150NU-212	GD150NU-224	GD150NU-248
Input	Battery Voltage	12V	24V	48V
	Voltage Range*1	10.5~17Vdc	21~34Vdc	42~68Vdc
	Current Range	10~16A	5~8A	2.5~4A
	No-load Current*2 (Low power mode)	0.4A	0.2A	0.1A
	No-load Current (Normal mode)	0.5A	0.3A	0.2A
	Standby Mode Consumption	7mA	7mA	4mA
	Sleep Mode Consumption	1mA	3mA	3mA
	Efficiency at Rated Load	90%	91%	92%
Output	Rated Power	150VA		
	Peak Power (3min.)	180VA (Refer to P.7)		
	Surge Power (3sec.)	210VA		
	AC Voltage (switchable)	230 default, 200/220/240Vac		
	Frequency (switchable)	50±0.1Hz default, 50/60Hz		
	Waveform	Sine Wave, <3%THD		
	Voltage Tolerance	±3.0%		
	LED indicators	Operating status, Battery voltage level, Output power level, Protection function, Operation setting		
Function	Remote-control	Output remote ON/OFF control terminal		
	Option terminal	Six-position four-conductor (6P4C) modular jack		
Protection	Input	UVP*3, OVP*4, input reverse polarity		
	Output	OLP*5, SCP*6, output voltage error		
	Others	OTP*7, detect by internal temperature sensors		
Environment	Operating Temperature	-20~+50°C at rated load, +60°C at 70% load (Refer to P.7)		
	Operating Humidity	20~90%RH non-condensing		
	Storage Temperature/ Humidity	-30~+70°C, 10~95%RH		
	Vibration	10~500Hz, 3G 10min./ 1cycle, 60mins. XYZ axes		
Safety & EMC	Safety Standards	Certified EN62368-1: 2014+A11:2017		
	Withstand Voltage	Battery I/P- AC O/P: 3.0kVac AC O/P- Ground: 1.5kVac Battery I/P- Ground:1.5kVac		
	Isolation Resistance	Battery I/P- AC O/P: >1000MΩ/500Vdc/25°C/70% RH AC O/P- Ground: >1000MΩ/500Vdc/25°C/70% RH Battery I/P- Ground: >1000MΩ/500Vdc/25°C/70% RH		
	EMC Immunity	EN55024:2010		
	EMC Emission	EN55032:2012		
Others	Accessories	Cable with plug*8	-	-
	Dimension	234.0×146.5×44.0mm (L×W×H)		
	Weight	0.9kg		

All parameters NOT specially mentioned are measured at 212: 12Vdc, 224: 24Vdc, 248: 48Vdc input, 150VA rated load, power factor=1.0, 25°C of ambient temperature and under the default setting.

*1 Tolerance of voltage: 212: ±0.5V, 224: ±1V and 248: ±2V.

*2 Average.

*3 UVP: Undervoltage Protection.

*4 OVP: Overvoltage Protection.

*5 OLP: Overload Protection.

*6 SCP: Short-circuit Protection.

*7 OTP: Over Temperature Protection.

*8 Length of cable: 1500±30mm

MODEL		GD300NU-212	GD300NU-224	GD300NU-248
Input	Battery Voltage	12V	24V	48V
	Voltage Range*1	10.5~17Vdc	21~34Vdc	42~68Vdc
	Current Range	20~32A	10~16A	5~8A
	No-load Current*2 (Low power mode)	0.7A	0.4A	0.2A
	No-load Current (Normal mode)	0.8A	0.5A	0.3A
	Standby Mode Consumption	7mA	7mA	4mA
	Sleep Mode Consumption	2mA	4mA	3mA
	Efficiency at Rated Load	90%		
Output	Rated Power	300VA		
	Peak Power (3min.)	360VA (Refer to P.7)		
	Surge Power (3sec.)	420VA		
	AC Voltage (switchable)	230 default, 200/220/240Vac		
	Frequency (switchable)	50±0.1Hz default, 50/60Hz		
	Waveform	Sine Wave, <3%THD		
	Voltage Tolerance	±3.0%		
	LED indicators	Operating status, Battery voltage level, Output power level, Protection function, Operation setting		
Function	Remote-control	Output remote ON/OFF control terminal		
	Option terminal	Six-position four-conductor (6P4C) modular jack		
Protection	Input	UVP*3, OVP*4, input reverse polarity		
	Output	OLP*5, SCP*6, output voltage error		
	Others	OTP*7, detect by internal temperature sensors		
Environment	Operating Temperature	-20~+40°C at rated load, +60°C at 70% load (Refer to P.7)		
	Operating Humidity	20~90%RH non-condensing		
	Storage Temperature/ Humidity	-30~+70°C, 10~95%RH		
	Vibration	10~500Hz, 3G 10min./ 1cycle, 60mins. XYZ axes		
Safety & EMC	Safety Standards	Certified EN62368-1: 2014+A11:2017		
	Withstand Voltage	Battery I/P-AC O/P: 3.0kVac AC O/P-Ground: 1.5kVac Battery I/P-Ground: 1.5kVac		
	Isolation Resistance	Battery I/P-AC O/P: >1000MΩ/500Vdc/25°C/70% RH AC O/P-Ground: >1000MΩ/500Vdc/25°C/70% RH Battery I/P-Ground: >1000MΩ/500Vdc/25°C/70% RH		
	EMC Immunity	EN55024:2010		
	EMC Emission	EN55032:2012		
Others	Dimension	234.0×146.5×44.0mm (L×W×H)		
	Weight	1.0kg		

All parameters NOT specially mentioned are measured at 212: 12Vdc, 224: 24Vdc, 248: 48Vdc input, 300VA rated load, power factor=1.0, 25°C of ambient temperature and under the default setting.

*1 Tolerance of voltage: 212: ±0.5V, 224: ±1V and 248: ±2V.

*2 Average.

*3 UVP: Undervoltage Protection.

*4 OVP: Overvoltage Protection.

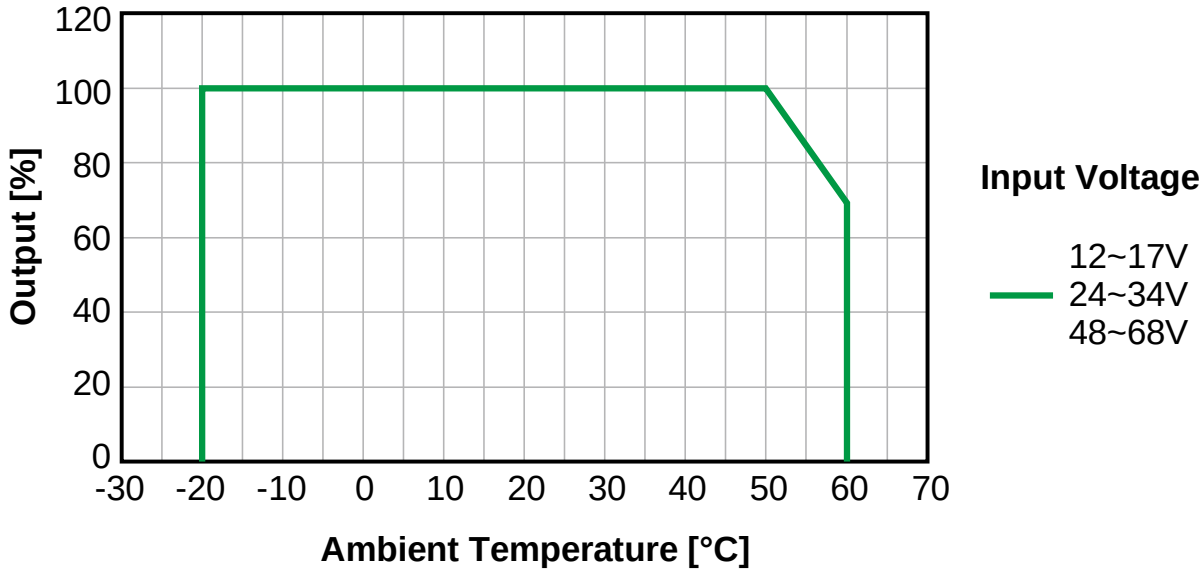
*5 OLP: Overload Protection.

*6 SCP: Short-circuit Protection.

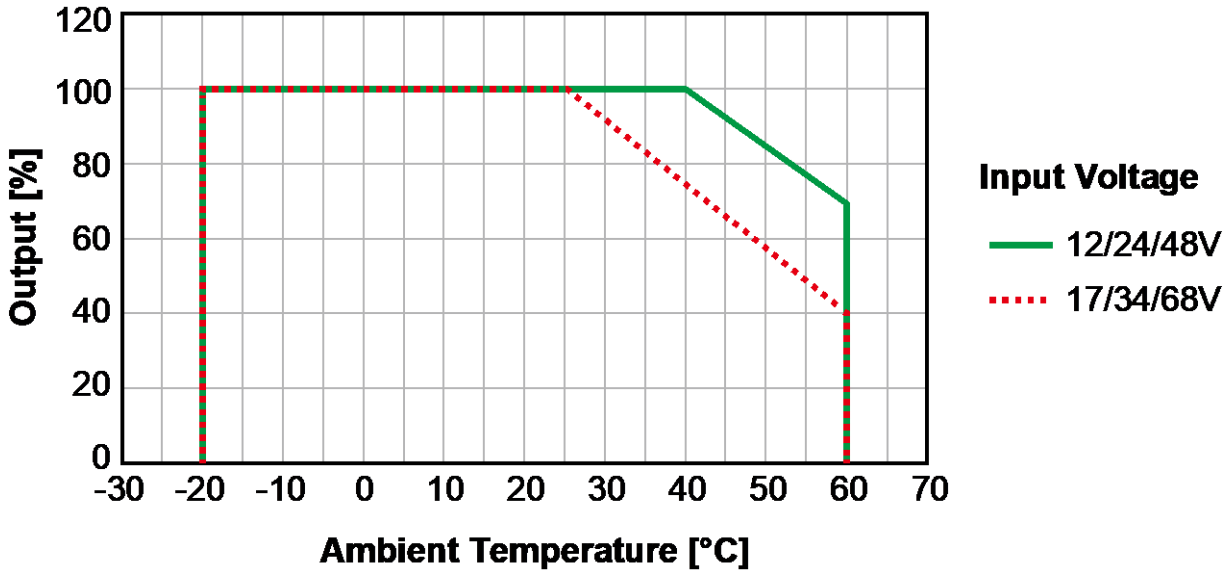
*7 OTP: Over Temperature Protection.

3-2 De-rating Curve

· GD150NU-212/224/248

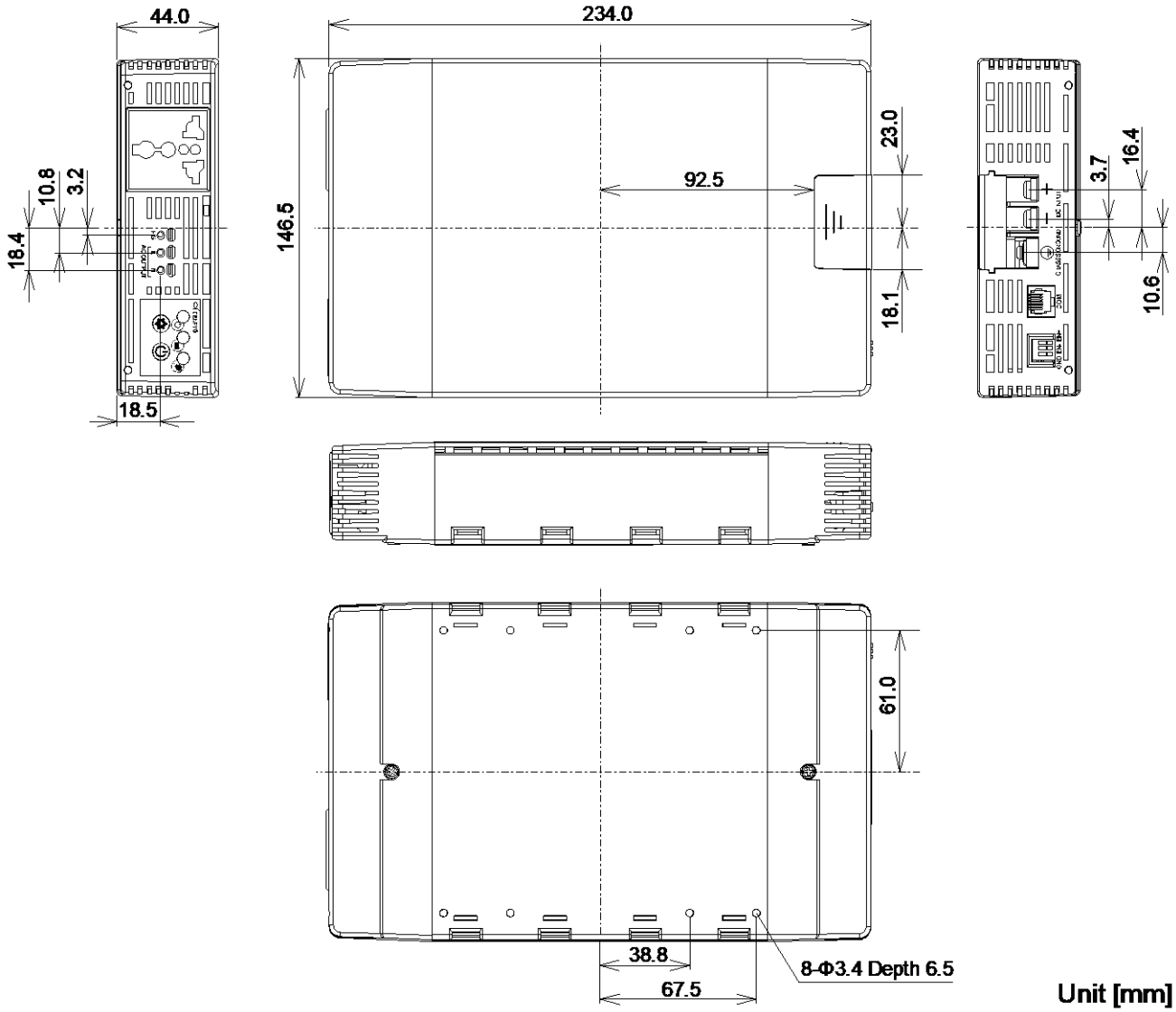


· GD300NU-212/224/248

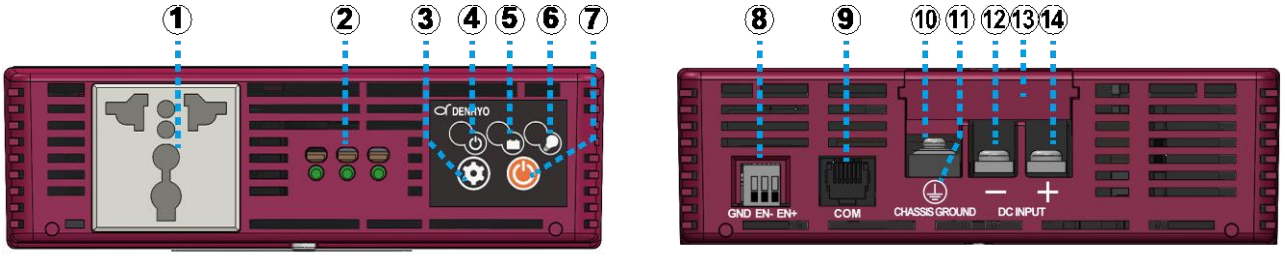


According to the environments, it happens that OLP or OTP protection works even in the range of de-rating curve. When output high rated power, please mount DIASINE® in the environment with as good as possible ventilation.

3-3 Dimension



3-4 Control Panel



The Front Panel

The Rear Panel

①	AC Outlet	②	AC Output Terminal	③	Setting Button	④	Power LED
⑤	Battery LED	⑥	Load LED	⑦	Power Button	⑧	Remote Connector
⑨	Optional Terminal	⑩	Grounding Terminal	⑪	Reversed Connection Warning LED		
⑫	Battery Input (-)	⑬	Terminal Cover	⑭	Battery Input (+)		

4. Installation and Wiring Connections

4-1 Installation Guide

Recommended installation location: Locate DIASINE® on a flat place or rack with sufficient strength. Avoid mounting and using in a dusty or high temperature environment. For ventilation, do not mount any objects within 15 cm area near the inverter.

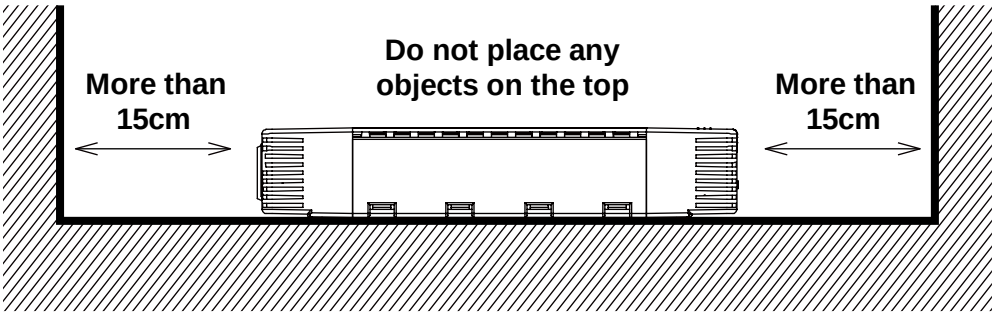


Figure 4.1 The example of installation

Recommended installation regulation: There are 8 holes, Φ3.4mm, and depth 6.5mm, in the bottom of DIASINE® (Refer to P.8) which could be utilized when installing inverter. It is recommended to install DIASINE® horizontally on the ground.

⚠ CAUTION	To avoid the risk of burn injury, do not touch anything other than the front panel of DIASINE® during or immediately after use.

4-2 Wiring Connections

To wire Battery wiring connections:

Remove terminal cover on rear side of DIASINE® and wire it to battery input terminal. Slide and push terminal cover toward inverter's bottom to move it. Mount fuse in plus side wiring. Please refer to Table 4.1 to select fuse size based on system. Please take suitable wire size for power supply terminal. The screw size of battery input terminal is M4; the width of terminal is 9 mm. Recommended wire size at full rated load is 12AWG (4mm^2) for GD150, 8AWG (10mm^2) for GD300; recommended torque for installation is 1.5 N·m. Too thin cable may lead to overheating or ignition of wire. Recommended length of battery wire should be as short as possible within 1.5 m. Before wiring battery, check if power LED in the front of inverter lights orange. Check battery voltage if not lighting. Furthermore, reverse connection warning LED near the grounding terminal in the rear of inverter lights red if polarity reversely connected. Please reconnect polarity and check if the warning LED turns off.

Table 4.1 Fuse size recommended

Model	Current	Model	Current
GD150NU-212	Under 20A	GD300NU-212	Under 40A
GD150NU-224	Under 10A	GD300NU-224	Under 20A
GD150NU-248	Under 5A	GD300NU-248	Under 10A

⚠ WARNING	Explosion Hazard It is very dangerous if battery short-circuited. Always wiring input terminal of inverter before battery.

To wire grounding

Wire grounding terminal in the rear of DIASINE® to the system. The screw size of grounding terminal is M5; the width is 14mm. Please use solderless terminals, like R5.5-5, and fasten it with a screw. Recommended wire size is 10AWG (6mm^2) and torque is 2.0 N·m.

To wire load

Connect load from AC outlet in the front of inverter or AC output terminal. Choose wire with proper withstand voltage of AC output terminal. VVF1.6 cable is recommended. Peel off wire coating around 15-20 mm. Inserting the wire into the hole marked as AC OUTPUT on the front panel until the peeled part is all inserted. Make sure line (L) and neutral (N) is not short-circuited. When removing the wire, insert a flathead screwdriver in the oval hole above the insert hole, and pull out wire while pressing the flathead screwdriver.

⚠ CAUTION	Terminal damage. Terminal may be damaged is pressing flathead screwdriver obliquely and strongly.

⚠ WARNING	Shock Hazard Make sure the core wire is fully inserted not exposed. Make sure inverter is not outputting while wiring AC terminal.

Be careful NOT to short-circuit line and neutral. Make sure wiring L and N correctly when wiring both outlet and AC terminal of inverter.

Precautions about load:

Most loads can work on AC power supplied by DIASINE®. However, some loads might not work even keeping supplying with 150VA (GD150)/300VA (GD300).

(1) Extremely large current, around 6~10times more than load's rated power, is required to startup inductive loads or motors. DIASINE® cannot work loads with surge current over specification. Check peak current the loads require before choosing inverter.

(2) To completely startup of inverter, when connecting a capacitive load or a rectifier such as switching power supply, do not activate the load and startup inverter at the same time. Alternatively, startup inverter with a smaller load and increase load afterward. If connecting more than two loads, please activate one load at once after inverter begins to output.

To wire Remote Connecter

By the function of remote connecter in the rear of inverter (Refer to P.15), inverter's AC output can be turned ON/OFF without pressing power button. Recommended wire size for remote connecter is 20~28AWG (0.08~0.5mm^2).

To wire Optional Terminal

Optional terminals in the rear of DIASINE® use a six-position four-conductor (6P4C) modular jack to adapt to various applications. Check DENRYO Official Website for more details.

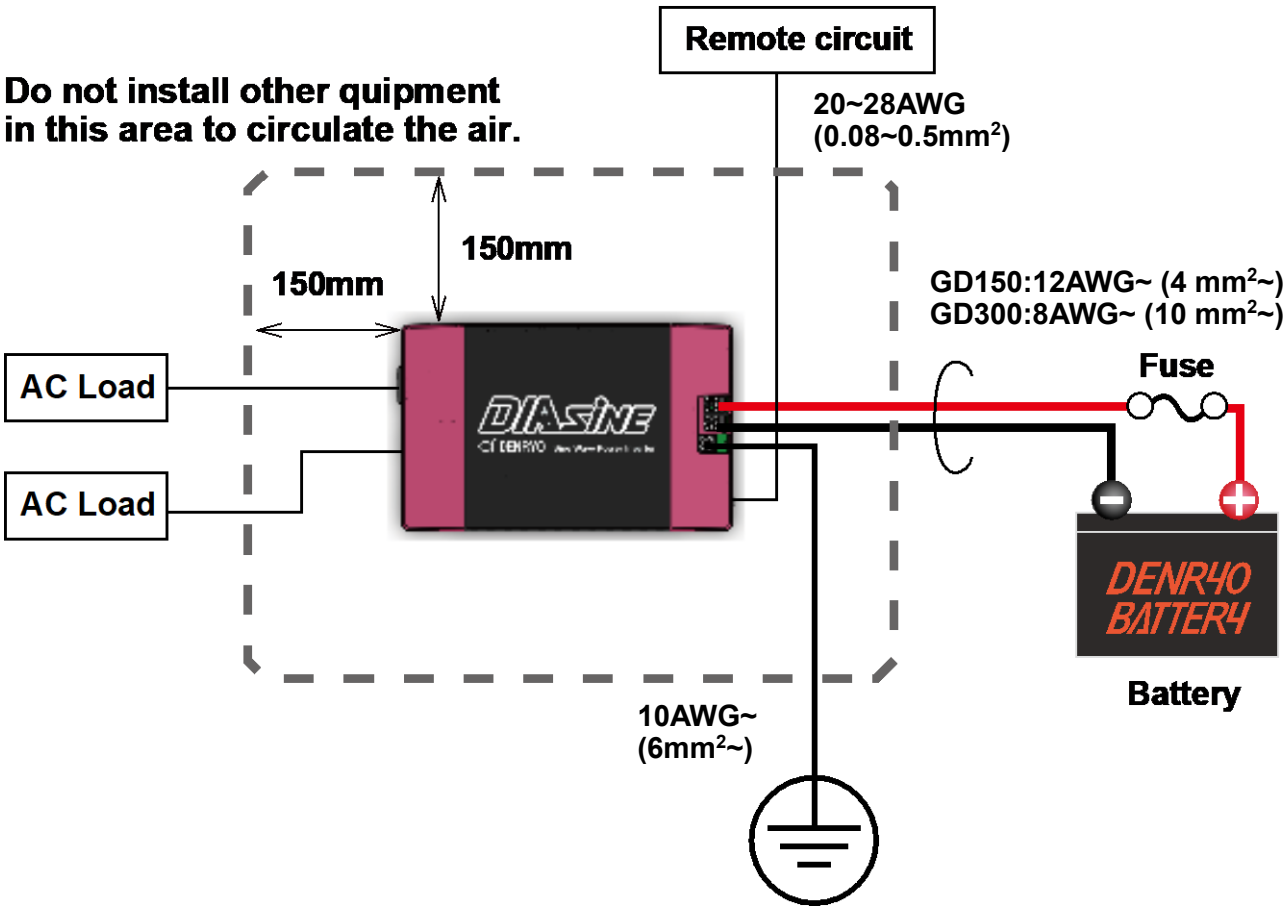


Figure 4.2 System Wiring Diagram

4-3 Current Setting Confirmation

DIASINE's default setting is: Output voltage 230Vac, output frequency 50Hz, low power mode (Refer to P.13) buzzer ON, and normal mode of LED brightness. Press setting button on the front panel to change settings (Refer to P.12) Settings remain even battery runs out power.

4-4 How to Start Up

Keep pressing power button on the front side of DIASINE® for 1 second. Make sure inverter is not under the protection mode by checking LED indicators (Refer to P.17) and turn on the load.

5. Functions

5-1 Change Settings

1. After connecting battery, DIASINE® is switched to standby mode. Under standby mode, orange LED stands and other LEDs are off. Do not connect anything to AC outlet and AC output terminal.
2. Pressing setting button under standby mode, the current setting displays around three seconds. To change settings, press and hold setting button. Hold down the button for about two seconds, when hearing a buzzer,* the power LED stands only. Release setting button and proceed to next step.
   *DIASINE® does not sound once buzzer is set OFF.
3. Check output frequency setting refers to Table 5.1. Press setting button to select color of power LED until it matches the color of output frequency and operation mode you choose. Hold setting button.
4. Check battery LED is lighting. Refer to Table 5.1, press setting button to select color of battery LED until it matches the color of output voltage you choose. Hold setting button.
5. Check only load LED on the right side of inverter is lighting. Refer to Table 5.1, press setting button to select color of load LED until it matches buzzer setting ON/OFF and LED brightness you chose. Press and hold power button for more than 2 seconds to complete setting process and back to standby mode. If pressing and holding setting button before holding down power button, setting mode begins again from setting of output frequency.
6. Press setting button. Check inverter's setting is as same as the setting you chose.

Figure 5.1 LED and settings button

Table 5.1 LED color of settings

LED / LED Color		Power LED	Battery LED	Load LED
Green	●	50Hz, Low power mode*	200Vac	Buzzer ON, bright LED*
Yellow	●	60Hz, Low power mode	220Vac	Buzzer ON, dark LED
Blue	●	50Hz, Normal mode	230Vac*	Buzzer OFF, bright LED
Purple	●	60Hz, Normal mode	240Vac	Buzzer OFF, dark LED

* Default setting.

5-2 Indicators of Setting during Operation

It is possible to check the current settings during operation by pressing setting button, refer to Table 5.1. Settings cannot be changed during operation.

5-3 Operation Mode

In low power mode, DIASINE® optimizes its operating condition depending on input voltage and load to suppress power consumption at low load. It is particularly effective when inverter operates for a long time at a small load of 0 to 100W. Changing mode setting will not change output waveform. However, under low power mode condition, if load suddenly increased, such as in the moment of a load activating, output waveform may be interrupted for a half cycle time about 10 milliseconds in the case of 50Hz output.
Without regard to load, for not to interrupt output waveform, please choose the normal mode. Regardless of the operation mode, output may stop momentarily when output current exceeds full rated current.

5-4 Sleep Mode

DIASINE® switches to standby mode after connecting batteries; power LED lights orange and other LEDs light off. Under standby mode, hold power button and setting button simultaneously for 3 seconds, turns inverter to sleep mode. Under sleep mode, all LEDs light off, power consumption can be suppressed more than standby mode. DIASINE® in sleep mode, is as same as standby mode, can be activated by power button or remote connector. However, settings cannot be confirmed or changed by pressing setting button in sleep mode. Hold power button and setting button again for 3 seconds turns inverter back to standby mode. Disconnect battery to cancel sleep mode.

5-5 Protective Function

To prevent error operation, DIASINE® is equipped with functions listed below.

A. Reversed battery polarity protection: Reverse warning LED near the grounding terminal in the rear of DIASINE® stands red when battery polarity is connected reversely. Please reconnected to correct polarity.

Reversed Connection Warning LED

B. Battery undervoltage protection: When battery voltage is lower than undervoltage warning value, inverter beeps three times consecutively around every 5 seconds. When battery voltage is lower than shutoff undervoltage value, DIASINE® automatically shuts off the output, inverter beeps five times consecutively around every 5 seconds with battery LED blinks red. When battery voltage is higher than undervoltage recovery value, DIASINE® automatically resume output. DIASINE® does not beep when buzzer setting is OFF.

MEMO	The undervoltage protection might work under the conditions such as the load consumes too heavy output power at the time of the engine starting. It might cause the output stops since the battery voltage drops.

C. Battery overvoltage protection: If battery voltage is higher than overvoltage warning value, inverter beeps three times consecutively around every 5 seconds. When battery voltage is higher than shutoff overvoltage value, the inverter automatically shuts off output, inverter beeps five times consecutively around every 5 seconds with battery LED lighting red. When battery voltage is lower than overvoltage recovery value, DIASINE® automatically resume output. Inverter does not beep when the buzzer setting is OFF.

CAUTION	Damage Hazard Please choose battery within inverter input voltage range. If using 12V battery with 24V model, battery voltage is lower than input voltage range, inverter will not operate. Conversely, if using 48V battery with 24V model, battery voltage is higher than input voltage range, inverter may be damaged.

D. Over temperature protection: When internal temperature of inverter is higher than over temperature warning value, inverter beeps three times consecutively around every 5 seconds. When the internal temperature further rises, over temperature protection works and automatically shuts off output, inverter beeps five times consecutively around every 5 seconds with power LED lighting red. When internal temperature drop to lower than the value, inverter automatically resumes output.

E. Output voltage error protection: When the AC output voltage is too high or too low, inverter shuts off the output, inverter beeps five times consecutively around every 5 seconds, and the load LED lights red. To cancel the protective status, please restart the Inverter.

F. Output short-circuit protection: When output terminal of inverter is short-circuited or the load suddenly increases, inverter stops AC output, inverter beeps five times continuously every 5 seconds, and load LED lights red. To cancel this protective status, please restart inverter.

G. Overload protection functions: When output is within the range of 100%~120% rated power, continues for about 3 minutes or more, and output continues for about 3 seconds more than 120% rated power, overload protective functions is activated to cut off output and buzzer. Inverter beeps five times consecutively every 5 seconds with load LED lighting red. Restart inverter to cancel overload protective functions.

MEMO	Protective functions can be canceled through turning output ON/OFF restarting inverter by remote connector. Find out the possible reasons causing protective functions work. Remove these errors first before restarting inverter.

Refer to Table 5.2 for input voltage setting values of protective functions. Also, refer to Table 6.4 for LED indicators when protective functions work.

Table 5.2 The input voltage setting value of protection

	Undervoltage			Overvoltage		
Model	Warning	Shut off	Resume	Warning	Shut off	Resume
212	11.5Vdc	10.5Vdc	12.5Vdc	16.5Vdc	17.0Vdc	16.5Vdc
224	23.0Vdc	21.0Vdc	25.0Vdc	33.0Vdc	34.0Vdc	33.0Vdc
248	46.0Vdc	42.0Vdc	50.0Vdc	66.0Vdc	68.0Vdc	66.0Vdc

When warning and protective functions work, buzzer could be set OFF by pressing setting button. If buzzer has been set OFF, inverter beeps again when other warning or protective functions work again. Moreover, even the warning status is cancelled, inverter beeps again when it turn to warning status again.

Example 1. Undervoltage warning is working and inverter is beeping. The buzzer has been set OFF by setting button. Inverter beeps again when it shuts off because of undervoltage protection.

Example 2. Over temperature warning is working and inverter was beeping. The buzzer has been set OFF by setting button. After temperature drops and warning released, inverter beeps again when temperature warning works again.

To set the buzzer OFF, refer P.12 to change the settings. (Refer to P.12)

5-6 Remote Connector

As the figure 5.4 method 1, input battery voltage to ENABLE+ (EN+) terminal of remote connector to turn inverter output ON. Inverter turns to standby mode or sleep mode when input removed. As the figure 5.4 method 2, connect ENABLE- (EN-) terminal and GND terminal to turn inverter output ON. Disconnect EN- terminal and GND terminal to turn inverter to standby mode or sleep mode. Power LED lights blue when inverter turned ON by remote connector. Inverter can be operated either by method 1 or method 2. When inverter turned on by EN+ terminal or EN- terminal input, press power button to turn inverter to standby mode or sleep mode. Output cannot be turned on until EN + terminal or EN - terminal input has been once removed even press power button under this mode.

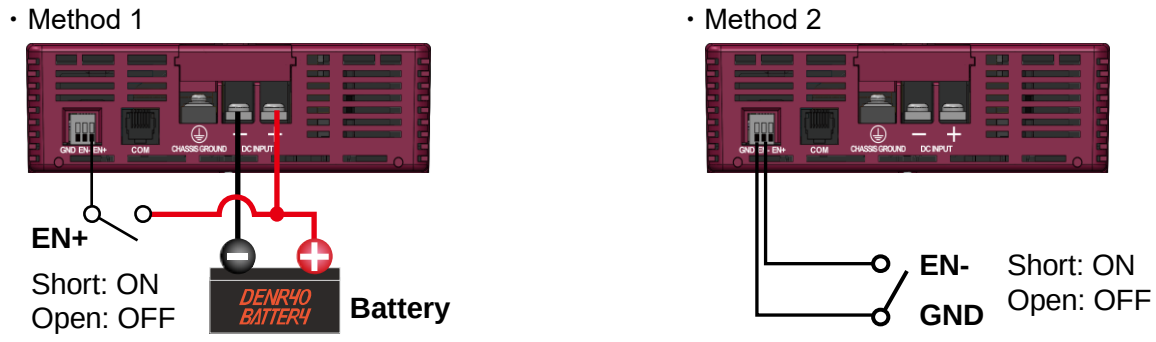


Figure 5.4 The wiring of remote connector

5-7 Optional Terminal

DIASINE® can achieve various application by using optional terminals on the rear of inverter. Check DENRYO Official Website for more details.

6. LED Indicators

MEMO	The blinking frequency of each LED indicator is once in two seconds, repeat lighting and off.

6-1 The LED Indicator in Normal Status

Power LED: Power LED indicates ON/OFF status of output or over temperature warning status. Refer to Table 6.1 for indicators of LED colors and status.

Table 6.1 Power LED Indicators

LED / LED Colors		Power LED
Orange		Standby
Blinking orange		Standby/ Sleep (Turned ON by remote connector*)
Green		Power ON
Blue		Power ON (Remote is operating)
Blinking yellow		Over temperature warning

*When inverter turned ON by remote connector, and turned OFF by power button, power LED blinks orange. In this case, output cannot be turned on until remote connector connection has been once removed. Power LED blinks orange even in sleep mode.

Battery LED: Battery LED indicates voltage value of battery during operation. Refer to Table 6.2 for indicators of LED colors and voltage value of battery. For battery voltage value of 224 and 248 models, multiply values listing below by 2 or 4 times.

Table 6.2 Battery LED Indicators

LED / LED Colors		Battery LED
Blinking yellow		Input voltage 10.5-11.5Vdc
Yellow		Input voltage 11.5-12.0Vdc
Green		Input voltage 12.0-14.0Vdc
Blue		Input voltage 14.0-16.5Vdc
Purple		Input voltage 16.5-17.0Vdc

Load LED: Load LED indicates percentage of output power during operation. Refer to Table 6.3 for indicators of LED colors and percentage of output power.

Table 6.3 Load LED Indicators

LED / LED Colors		Load LED
Blue		0-40% output power
Green		40-70% output power
Yellow		70-100% output power
Blinking yellow		Over than 100% output power

6-2 LED Indicators when Protective Function Activates

When DIASINE's protective functions work, LED indicates status of protective function and cut off outputting. Refer to Table 6.4 for LED indicators and status of protective functions.

Table 6.4 The Indicators of protective functions

Lighting LED / Indicators		Power LED	Battery LED	Load LED	All LED
Blinking Red		---	Input undervoltage	AC output error	Internal error*
Red		Over temperature	Input overvoltage	Overload/Load terminal short-circuited	

* Please consult with dealer if internal error occurs.

7. Troubleshooting Guide

Error Condition	Possible Cause	Solution
No AC output voltage	Input voltage error Battery LED lights red/ blinks red	Check DC input voltage and take input voltage within the specification.
	Over temperature protection Power LED lights red	Check if ventilation is blocked or air temperature is too high. Please reduce load capacity or lower air temperature around inverter.
	Overload protection Load LED lights red	Check if load capacity, including instantaneous value, exceeds rated value of load or not.
	Short-circuit protection Load LED lights red	Check if load wiring connection is short-circuited or not.
	AC output terminal wiring problem	Check if wiring connection to AC output terminal is appropriate or broken.
	Internal error All LEDs light red/blink red	Internal parts of inverter may be damaged. Please consult the dealer.
Short operation time of inverter	Battery problem	Please change battery.
	Lack of battery capacity	Please check battery specifications and increase battery capacity.
Output voltage, frequency error	Wrong setting	Change settings (Refer to P.12)
Power LED does not light up even connecting battery	Reversed connection of battery polarity Reversed connection warning LED lights red	Reconnect correct polarity
	Internal fuse cuts off	Internal parts of inverter may be damaged. Please consult with the dealer.
	Under sleep mode	Hold power and setting button for 3 seconds. If LED still not lighting up, disconnect battery and reconnect after 5 seconds.
Remote connector does not work	Wiring problem	Check if wire connection of remote connector is correct.
Unusual noises when loads operate such as radio	Switching noise	Try ways* below to reduce noise: 1. Keep inverter away from loads 2. Wire grounding terminal 3. Install appropriate line filter circuit

* The effect differs depending on environments or devices

If the error condition cannot be solved, please consult the dealer.

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