

NEC

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INVERTER

121PW111

DATA SHEET

(2nd edition)

**All information is subject to change without notice.
Please confirm the delivery specification before starting
to design your system.**

INTRODUCTION

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NEC products are classified into the following three quality grades:

"Standard", "Special", "Specific"

The *"Specific"* quality grade applies only to applications developed based on a customer designated "quality assurance program" for a specific application. The recommended applications of a product depend on its quality grade, as indicated below. Customers must check the quality grade of each application before using it in a particular application.

Standard: Computers, office equipment, communications equipment, test and measurement equipment, audio and visual equipment, home electronic appliances, machine tools, personal electronic equipment and industrial robots

Special: Transportation equipment (automobiles, trains, ships, etc.), traffic control systems, anti-disaster systems, anti-crime systems, safety equipment and medical equipment (not specifically designed for life support)

Specific: Military systems, aircraft, aerospace equipment, submersible repeaters, nuclear reactor control systems, life support systems (medical equipment, etc.) and any other equipment

The quality grade of this product is *"Standard"* unless otherwise specified in this document. If customers intend to use this product for applications other than those specified for *"Standard"* quality grade, they should contact NEC Corporation sales representative in advance.

Anti-radioactive design is not implemented in this product.

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1. DESCRIPTION

121PW111 is type name of inverter. And the inverter consists of inverter circuit board, transformer and electric parts. Adaptable modules are as follows.

Adaptable LCD modules
NL8060AC31-12, NL8060AC31-12G
NL8060BC31-17, NL8060BC31-17D
NL8060BC31-20

This inverter has luminance control functions.

- Two steps control by BRTHL terminal.
- Variable steps control by a voltage or variable resistor.

2. SPECIFICATION

2.1 GENERAL SPECIFICATIONS

Item	Specification	Unit
Inverter size	26.0± 0.8 (H) × 125 + 1.0 (V) × 12.0 max. (D) - 0.5 (V)	mm
Weight	21(typ.), 25 (max.)	g
Delivery unit	10 (min.)	set

2.2 ABSOLUTE MAXIMUM RATINGS

(Ta=25°C)

Parameter	Symbol	Rating	Unit	Remarks
Storage temp.	Tst	-20 to +60	°C	-
Operating temp.	Top	0 to +60	°C	-
Supply voltage	VDDDB	15	V	Ta = 25°C
Lamp voltage	VL	1800	Vrms	Ta = 25°C
Relative Humidity Note1		≤ 95	%	Ta ≤ 40 °C
		≤ 85		40<Ta ≤ 50 °C
Absolute Humidity Note1		≤ 70 Note2	g/m ³	Ta > 50°C

Note1: No condensation

Note2: Ta=50°C, RH=85%

2.3 ELECTRICAL CHARACTERISTICS

(1) Inverter (Ta=25±2°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
Supply voltage	VDDB	11.4	12.0	12.6	V	-
Supply current	IDDB	-	600	700	mA	Per two lamps VDDB=12.0V Luminance:100%
Open lamp voltage	Vo	1600	1700	-	Vrms	Ta = 25°C
Oscillator frequency	FO	58	65	69	kHz	Note 1
Luminance control range	-	-	20-100	-	%	Maximum luminance: 100%

< Fuse >

Parameter	Fuse		Rating	Fusing current Note1
	Type	Supplier		
VDDB	11CT1A	SOC Corporation	1.0A	2.0A
			72V	

Note1: The power supply capacity should be more than the fusing current. If the power supply capacity is less than the fusing current, the fuse may not blow for a short time, and then nasty smell, smoking and so on may occur.

(2) Lamp (reference)

• NL8060AC31-12, 12G (Ta=25±2°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
Lamp current	IL	2.0	5.0	6.0	mArms	Luminance(20%)=2mA(typ.) Luminance(100%)=5mA(typ.) Per lamp, Note 1
Lamp voltage	VL	-	630	-	Vrms	at IL = 5.0mArms
Lamp turn on voltage Note 2	VS	850	-	-	Vrms	Ta = 25°C
		1200	-	-	Vrms	Ta = 0°C

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• NL8060BC31-17, 17D (Ta=25±2°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
Lamp current	IL	2.0	5.0	5.5	mArms	Luminance(20%)=2mA(typ.) Luminance(100%)=5mA(typ.) Per lamp, Note 1
Lamp voltage	VL	-	600	-	Vrms	at IL = 5.0mArms
Lamp turn on voltage Note 2	VS	960	-	-	Vrms	Ta = 25°C
		1200	-	-	Vrms	Ta = 0°C

• NL8060BC31-20 (Ta=25±2°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Remarks
Lamp current	IL	3.0	5.0	5.5	mArms	Note 1
Lamp voltage	VL	-	600	-	Vrms	at IL = 5.0mArms
Lamp turn on voltage Note 2	VS	960	-	-	Vrms	Ta = 25°C
		1200	-	-	Vrms	Ta = 0°C

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Note 1: In an atmosphere of below 10°C, keep the lamp current more than 3.0mArms in order to prevent the lamp from blinking.

Note 2: The phase of the supply voltage for lamps must keep same one.

2.4 INTERFACE PIN CONNECTIONS

CN1 socket (Inverter side): LZ-5P-SL-SMT (Japan Aviation Electronics Industry Limited (JAE).)
 Adaptable plug: LZ-5S-SC3 (Japan Aviation Electronics Industry Limited (JAE).)

Pin No.	Symbol	Function	Remarks
1	VDDB	12V ± 5%	-
2	VDDB	12V ± 5%	
3	GNDB	Backlight ground	
4	GNDB	Backlight ground	
5	BRTHL	Luminance control	Note 1

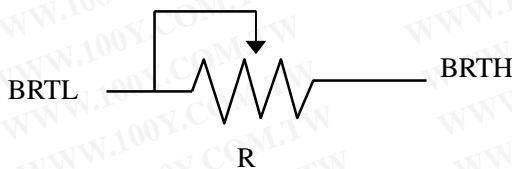
Note 1: BRTHL = “+5V” or “Open”: Luminance (100%)
 BRTHL = “GNDB level”: Luminance (20% Typ.)

CN3 socket (Inverter side): IL-Z-3PL-SMTY (Japan Aviation Electronics Industry Limited (JAE).)
 Adaptable plug: IL-Z-3S-S125C3 (Japan Aviation Electronics Industry Limited (JAE).)

Pin No.	Symbol	Function	Remarks
1	BRTC	Backlight on/off	Note 1
2	BRTH	Luminance control input	Note 2,3
3	BRTL	Luminance control input	

Note 1: BRTC = “+5V” or “Open”: Backlight “on”
 BRTC = “GNDB level”: Backlight “off”

Note 2: A way of luminance control by a variable resistor.
 This way works when BRTHL (No.5 pin) of CN1 is opened.



Mating variable resistor: 10 kΩ±5 %
 Minimum luminance (20% Typ.): R = 0 Ω
 Maximum luminance (100%): R = 10 kΩ

Note 3: A way of luminance control by a voltage.
 This way works when BRTL and BRTHL are opened.
 The range of input voltage between BRTH and GNDB are as follows.

Minimum luminance (20% Typ.): 3.45V
 Minimum luminance (100%): ≤ 1.0V

CN2 socket (Lamp connector side): BHR-03VS-1 (J.S.T TRADING COMPANY, LTD.)
 Adaptable plug: SM03(4.0)B-BHS-TB (J.S.T TRADING COMPANY, LTD.)

Pin No.	Symbol	Function	Remarks
1	V _{LOW}	Low voltage terminal	-
2	V _{HIGH}	High voltage terminal	-
3	V _{HIGH}	High voltage terminal	

Remark: V_{HIGH} and V_{LOW} must be connected correctly. If you make a mistake to connect, you will get hurt and the module will break.

3. RELIABILITY TEST

This test is in accordance with the LCD module. Refer to Reliability Test of the LCD module.

4. PRECAUTIONS

Because next figures and sentences are very important, please understand these contents as follows.



CAUTION

This figure is a mark that you will get hurt and/or the module will have damages when you make a mistake to operate.



This figure is a mark that you will get an electric shock when you make a mistake to operate.



This figure is a mark that you will get hurt when you make a mistake to operate.



CAUTIONS



Do not touch an inverter --on which a caution label is stuck -- while the LCD module is working, because of high voltage.

(1) Safety precautions

- a. Because high voltage is present when the inverter is working, there is danger of electrical shock. So that makes secure powered off when you handle the inverter.
- b. Do not apply impulse and pressure to the inverter, otherwise the parts may damage.
- c. There is danger that the inverter is charged at high voltage after use of the module, be sure to wait some time after switching power OFF before starting work.
- d. Do not give the stress to interface connectors. The module may become function deficiency by a contact defective and damages. Pay attention to handling at the time of matching connector connection and in the connection condition.

(2) Quality precautions

- a. Static electricity may damage the product (LCD module). When handling the product, take adequate care to eliminate static electricity (grounding band, ion shower, etc.). Periodically inspect your ion shower, etc., to check performance.
- b. Dewdrop atmosphere must be avoided.
- c. Do not store and/or operate the LCD module in a high temperature and/or high humidity atmosphere. Storage in an anti-static pouch and under the room temperature atmosphere is recommended.
- d. In order to prevent dew condensation occurring by temperature difference, the product packing box must be opened after leave under the environment of an unpacking room temperature enough. Because a situation of dew condensation occurring is changed by the environmental temperature and humidity, evaluate the leaving time sufficiently. (Recommendation leaving time: 6 hour or more with packing state)
- e. Do not operate the LCD module in high magnetic field.

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(3) Other cautions

- a. Do not disassemble and/or reassemble inverter.
- b. Do not readjust variable resistors or switches etc.
- c. Set an inverter 1mm or more away from attachment positions in order to prevent the inverter from bending.
 - e.g., Washer condition: The washer thickness (P) = 1.0mm (min.)
The washer diameter (ϕ) = 5.0mm (Recommended value)

(4) Disposal method

- a. The lamp holder contains cold cathode fluorescent lamps. Please follow local ordinances or regulations for its disposal.

5. OUTLINE DRAWINGS (reference)

(Unit: mm)

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