

# NEC

## INVERTER

Type: 104PWBJ1

## SPECIFICATIONS

First edition

Adaptable LCD module  
NL6448AC33-18

NEC Corporation  
Display Device Operations Unit  
Color LCD Division  
Application Engineering Department

Approved	<i>W. Taki</i>	Sep. 10, 1999
Checked	<i>T. Kusano</i>	Sep. 10, 1999
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**DESCRIPTION**

104PWB11 is type name of inverter to replace. And the inverter consists of inverter circuit board, transformer and electric parts. Adaptable module is as follows.

- NL6448AC33-18

**1. GENERAL SPECIFICATIONS**

Items	Specifications	Unit
Inverter size	$25.0 \pm 0.3$ (H) $\times$ 100.0 $\begin{matrix} +0.7 \\ -0.3 \end{matrix}$ (V) $\times$ 10.2 max. (D)	mm
Weight	15 (typ.), 16 (max.)	g
Delivery unit	10 (min.)	sets

**2. ABSOLUTE MAXIMUM RATINGS FOR LCD MODULE**

Parameters	Symbols	Ratings	Unit	Remarks
Storage temp.	Tst	-30 to +60	°C	—
Operating temp.	Top	0 to +50	°C	Module surface note 1
Lamp voltage	VL	2000	Vrms	—
Supply voltage	VDDB	15	V	—
Relative humidity (RH)	Note 2	$\leq 95$	%	Ta $\leq 40$ °C
		$\leq 85$	%	40 < Ta $\leq 50$ °C
Absolute humidity	Note 2	Absolute humidity shall not exceed Ta=50°C, 85% relative humidity level.	g/m <sup>3</sup>	Ta > 50 °C

note 1: Measured at the LCD panel of the module with a inverter.

note 2: No condensation

**3. ELECTRICAL CHARACTERISTICS**

(1) Inverter input

(Ta=25°C)

Items	Symbols	Min.	Typ.	Max.	Unit	Remarks
Supply voltage	VDDB	11.4	12.0	12.6	V	—
Supply current	IDDB	—	500	550	mA	with two lamps
Noises	—	—	—	25	dB	At distance of 5cm
Oscillator frequency	Ft	50.0	54.0	58.0	KHz	—
Luminance frequency	FB	250	270	290	Hz	—

Inverter output

(Ta=25°C)

Items	Symbols	Min.	Typ.	Max.	Unit	Remarks
Lamp current	IL	—	5.0	—	mA	with one lamp
Lamp voltage	VL	—	510	—	Vrms	—
Power consumption	PL	—	2.55	—	W	—
Open lamp voltage	Vs	1265	—	—	V	—

4. INTERFACE PIN CONNECTION

CN1

Part No.: LZ-5P-SL-SMT

Adaptable socket: LZ-5S-SC3

Supplier: Japan Aviation Electronics Industry Limited (JAE)

Pin No.	Symbol	Remarks
1	VDDB	Power supply
2	VDDB	Power supply
3	GNDB	Backlight ground
4	GNDB	Backlight ground
5	BRTHL	Luminance select Note 1

Note 1: A way of luminance select

BRTHL = "H" or "Open" : luminance 100%  
 "L" : luminance 60% (typ.)

CN2

Part No.: SM03(4.0)B-BHS-TB

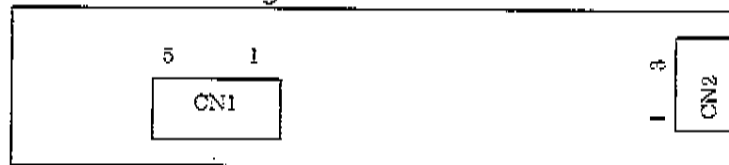
Adaptable socket: SM02(8.0)B-BHS-TB

Supplier: J.S.T TRADING COMPANY, LTD.

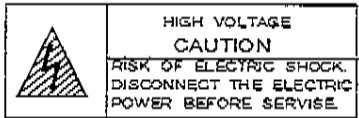
Pin No.	Symbol	Remarks
1	VL	Low voltage terminal
2	VH	High voltage terminal
3	VH	High voltage terminal

Note 1: VH and VL must connect correctly. If you make a mistake to connect, you will get hurt and the module will break.

The connector mounting side



5. MARKINGS

	Contents	Indication position
Type name	104PWBJI	on the board
Caution label		on the protection sheet

6. RELIABILITY TEST

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

## 7. PACKING, TRANSPORTATION, AND DELIVERY

Supplier will pack products to be delivered to customer in accordance with supplier's packing specifications, and will deliver them to customer in such a state that they will not suffer damage during transportation. The delivery conditions are as follows.

### (1) Outer box

As shown in the figure, five or ten inner boxes are packed in an outer box. There is a risk of damage to the products if the outer box is dropped from a height of 60 cm or more, and therefore care should be taken in handling the box during transportation. When a box is stored in a warehouse, etc., care should be taken to ensure that the storage temperature is not exceeded.

### (2) Inner box

The parts number and quantity are shown on the inner box, either printed directly or on a label. Products should not be transported in the inner box alone, since there is a risk of damage.

### (3) Inspection result sheet

An inspection result sheet is included for delivered products with each inner box. The inspection result sheet should summarize a number of products for which pass/fail assessment has been performed.

### (4) Means of transportation

Products are to be transported by hand, light van, truck, airplane, or ship.

#### Reference

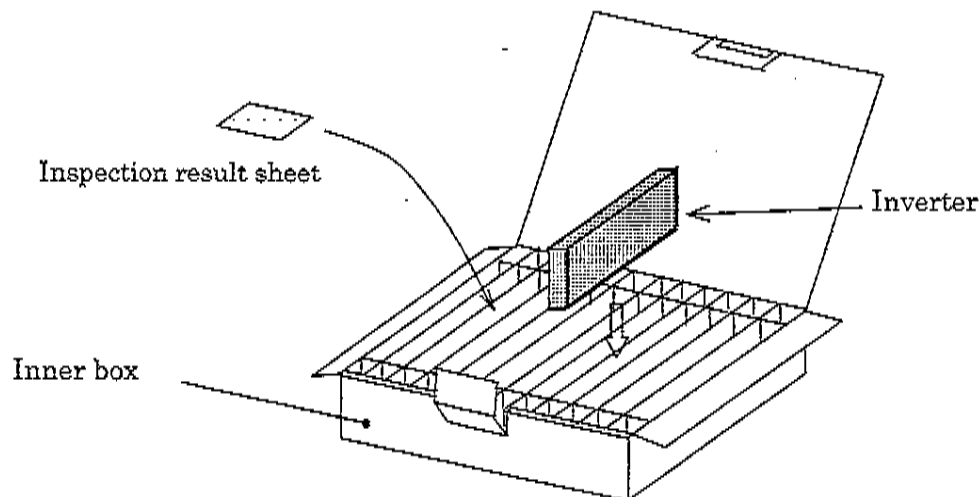
Box dimensions Inner box: 210(W) x 157(D) x 47(H)

Outer box: 335(W) x 231(D) x 282(H)

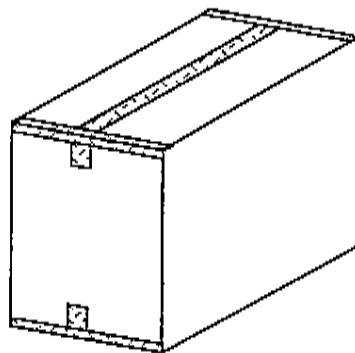
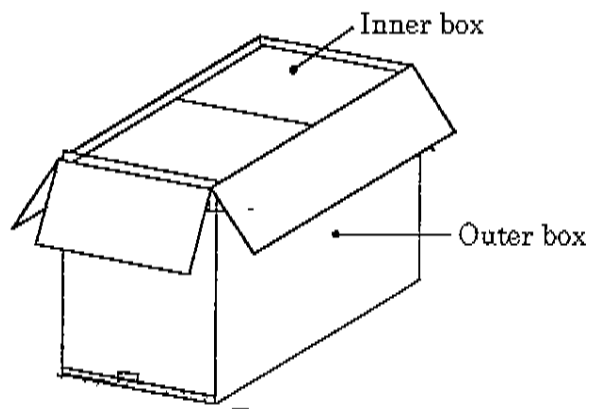
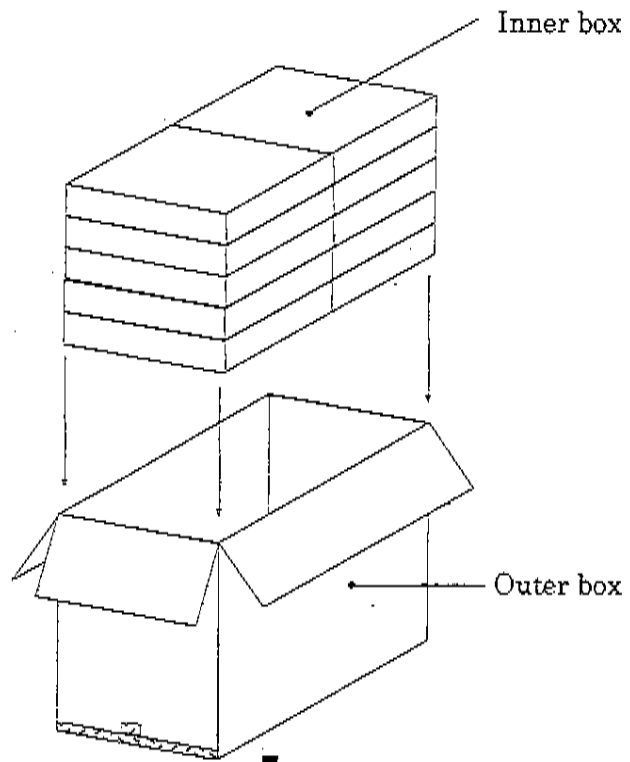
Weight Inner box: Approx. 100g

Outer box: Approx. 600g

Total weight: Approx. 3kg (with a Outer box, 10 inner boxes and 10 inverters)



1. Inner box



**8. SHIPPING INSPECTION (104BLM-17 is used for the measurement)**

The inspection of the following item is carried out about all the products at the time of shipping.

1. Supply current
2. Outside appearance

**9. CHANGE CONTROL**

Design changes may be made for this product relating to the specifications, appearance, parts used, circuits, and etc., for the purpose of product improvement.

If a design change is judged to affect the specifications of this product, supplier shall inform customer of the change in advance.

**10. QUALITY ASSUARANCE**

In the event of a product failure under normal operating conditions, and in the event of product trouble that can be deemed to be the responsibility of supplier, supplier shall replace free of charge the product, which is delivered within six month.

However, supplier shall not bear responsibility for the quality of a product in the case of modifications other than those specified by supplier.

**11. MAINTENANCE**

The specifications of the functions of maintenance parts may be partially changed with in a range, which provides for equivalent or better quality. Maintenance parts shall in principle be product units.

If the product discontinuation is planned, supplier shall notify customer in six months before.

**12. HANDLING OF DOUBTFUL POINTS**

If any doubt arises concerning a matter not stipulated in this specification, the matter is to be resolved by mutual agreement between customer and supplier, and supplier shall make efforts for improvement.

### 13. GENERAL CAUTIONS

Because next figures and sentence 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, make secure powered off when you handle the inverter and the lamp holder.
- b. Do not 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 touch connector pins to avoid bad connection. When handling, take adequate caution.

#### (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. Do not operate the LCD module in high magnetic field.



#### (3) Other cautions

- a. Do not disassemble and/or reassemble inverter.
- b. Do not a readjust variable resistors nor switches etc.

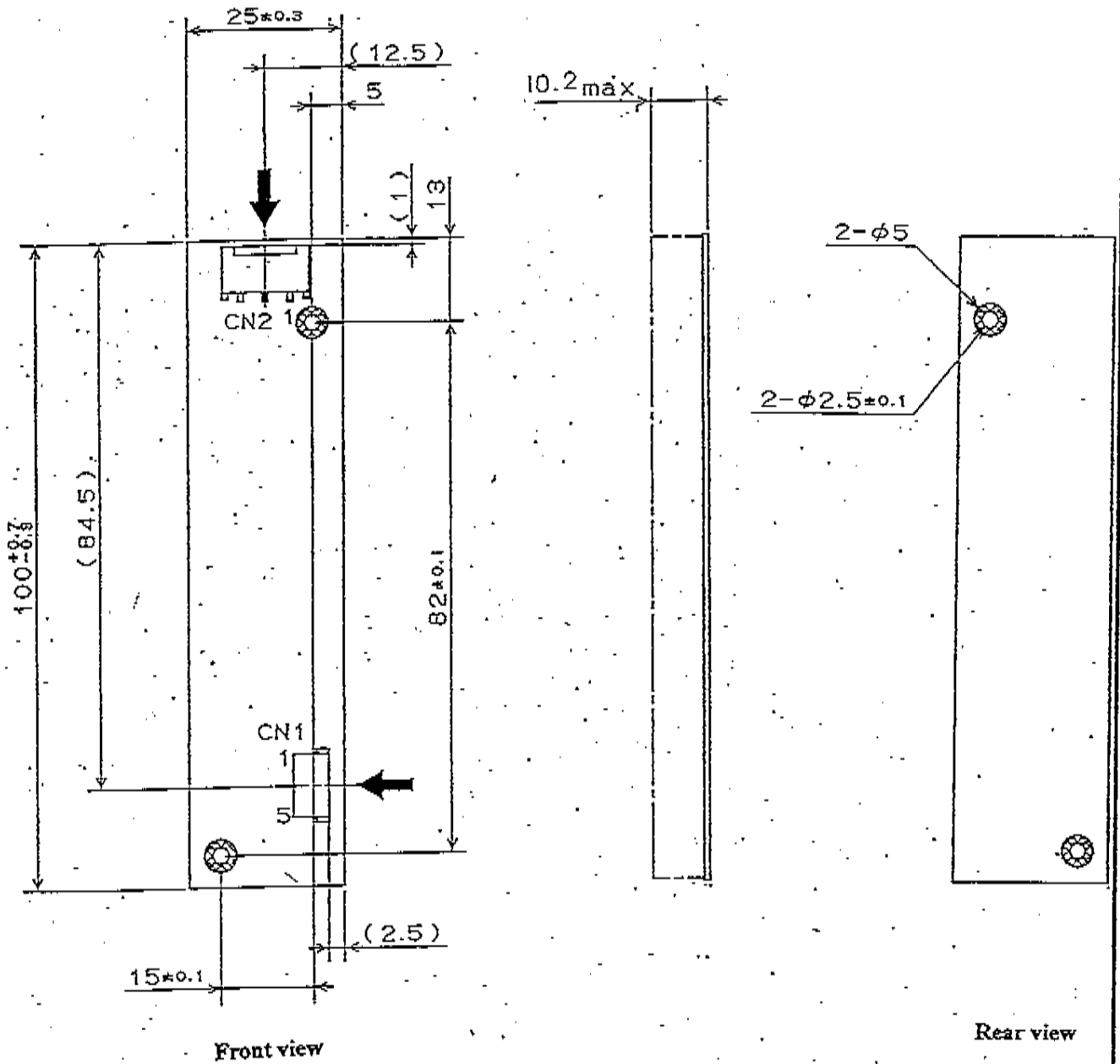
#### (4) Disposal method


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



14. OUTLINE DRAWING

(Unit: mm)



Revision History				DDS-SAI0387	10/10	
Rev.	Prepared Date	Revision contents	Approved	Checked	Prepared	Issued date
1	Sep. 10, 1999	Planning Department <u>Y. Suai</u> Product Engineering Department <u>Id. Kaneko</u> Reliability and QC Department QA: <u>N. Takano/hashi</u> Application Engineering Department <u>S. Takahashi</u>	<u>T. Takai</u>	<u>T. Kusamagi</u>	<u>N. Kano</u>	 99.9.27 行