

**MESSRS :**

---

## Product Drawing

---

**CUSTOMER'S PRODUCT NAME :**

---

**TDK PRODUCT NAME : DC/AC INVERTER UNIT CXA- P1212D-WJL**

---

**\*Notice**

Product Drawing is not contract. This is only technical data.

This technical data may change internal description without any notice.

When you design final product please request us specification through our sales or distributors.

After you receive the specification, the contract is effective on signature of the specification.



**TDK-Lambda Corporation**

PREPARED BY	APPROVED BY	AUTHORIZED BY
<i>Apr/21/2010 N.Suzuki</i>	<i>Apr/621/2010 K.Yamaishi</i>	<i>Apr/21/2010 H.Masuoka</i>

DWG.No.	CTR-3774-A
---------	------------

## Precautionary Notes Regarding the Use of This Inverter

**When using this product, give due consideration to the precautionary notes described below and ensure a safe design. Inappropriate use may result in electric shock, injury or fire.**

### **Warning**



- This product is subject to high voltage. Do not touch it while the power is on. Failing to do so may result in electric shock.

### **Caution**

- This product is designed for the lighting of a Cold Cathode Fluorescent Lamp. Do not use it with any other load.
- Store this product under the conditions defined in the specification document.
- Do not store this product in an environment where dust, dirt or corrosive gas (salt, acid, base, etc.) is present.
- This product is subject to high voltage. If there is a possibility that the user may touch the product, provide a proper indication in order to draw the user's attention.
- This product is designed for use with general electronic equipment.
  - If it is to be used with medical equipment that directly affects human life or for the control of transportation equipment to which passengers entrust their lives, provide thorough fail-safe measures.
- If this product use for in-vehicle or always vibrated place, please consult us before using.
- Avoid using this product under high temperatures or high humidity or in an environment in which dust, dirt or any corrosive gas (salt, acid, base, etc.) is present.
  - Also, be careful not to allow the formation of dew condensation. It may result in damage or electric shock.
- If the product does not have a built-in protective circuit (circuit breaker, fuse, etc.), it is recommended that a fuse be used at the input stage to prevent the generation of smoke or fire in the event of a malfunction.
  - Even when the product has a built-in protective circuit (circuit breaker, fuse, etc.), the circuit may not function properly due to inappropriate operating conditions or power-supply capacity. It is recommended that an appropriate protective circuit (circuit breaker, fuse, etc.) be provided separately from the built-in circuit.
- Use the product only within the specified input voltage, output power, output voltage and operating temperature ranges. Exceeding these values may result in damage, etc.
- Provide a measure for the prevention of surge voltage due to lightning, etc.
  - Abnormal voltage may result in damage, etc.
- To prevent problems arising from short-circuiting of the high-voltage section, provide appropriate measures to prevent the entry of foreign substances following installation.
- This product is not designed to provide resistance to radiation.
- Please fix the inverter by using all the mounting holes to protect the inveter against vibration and shock.
- Ripples could be superimposed on the voltage and the current in the input source connected to the inverter, depending on the impedance in the input source, wiring, etc.
  - When you select an input source, please check waveforms, etc on the final set.

## Handling Precautions

- This product uses thin wires. Observe the following precautions and handle it with care so as not to cause wire breakage. Broken wire may result in damage, etc.
  - ❖ Do not stack multiple products on top of one another.
  - ❖ Do not allow the product to come in contact with tools, etc.
- Do not apply excessive stress during installation.
  - It may cause chipping and cracking, resulting in damage, etc.
- Provide clearance between the high-voltage section of this product and the frame body on which the product is installed and also the conductor section as per listed on page 2, [1] "Outline".
- Please do not use the product, when dropping it, since there is a possibility of the parts damage.
  - Please confirm abnormality is not found in the product enough when using it by any chance.

	No.	MATERIALS NAME	QU	MATERIAL	REMARK
	PRODUCT NAME or MODEL, TITLE				
	DC-AC INVERTER UNIT CXA-P1212D-WJL				
<b>TDK-Lambda</b>	NAME OF DRAWING		DRAWING No.		PAGE
	Product Drawing		CTR-3774-A		1

<The drawings may be changed without any notice.>

1. Part Name

The part name is CXA-P1212D-WJL.

2. Contents

Item	Attached view	Page
[1] Outline		
Outline	[1] section	3
Connector Configuration	[1] section	4~5
[2] Absolute Maximum Ratings	[2] section	5
[3] Electrical specifications	[3] section	6
[4] Test Circuit	[4] section	6~7
[5] Reliability Test	[5] section	8
[6] Packing and Marking	[6] section	9
[7] Others	[7] section	9
Test Cond.		
Std Warranty		
Others		

No.	MATERIALS NAME	QU	MATERIAL	REMARK
PRODUCT NAME or MODEL, TITLE				
DC-AC INVERTER UNIT CXA-P1212D-WJL				
NAME OF DRAWING		DRAWING No.		PAGE
Product Drawing		CTR-3774-A		2

**TDK-Lambda**

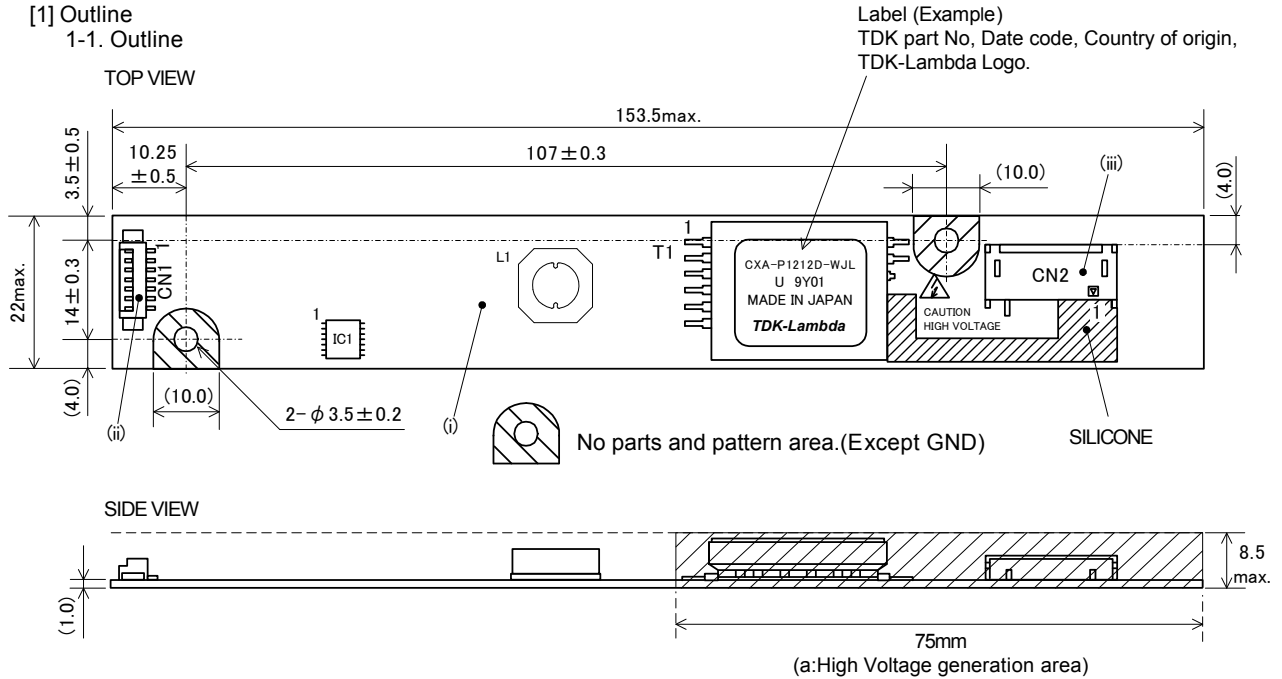
<The drawings may be changed without any notice.>

●Features●

- This inverter is for two lamps. It has Dimming function(PWM System) and Remote function.
- This product has shutdown function.  
It prevents from keeping generating the high voltage when the lamps open.(Refer Note. 4-4.)
- With lamp failure detector.  
Normal Operation : CN1-6=0V  
Some Lamps Open : CN1-6=5V
- Select the way of dimming (between CN1-6 and CN1-7)
  1. Insert a potentiometer (0-50kΩ)
  2. Apply the voltage (0-2.5V)
- The high-voltage area (terminals and patterns) is coated with silicone so as to avoid the defects caused by dust.
- This product is conformity to RoHS directive. (※)  
(※) Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

[1] Outline

1-1. Outline



\*Please secure the air clearance of 3mm or more from the high voltage generation area up and down and right and left. Please refer to Note1-3. for details.

Part Description	No.	Material	QU	REMARK
PCB	(i)	Composite (CEM-3)	1	UL94V-0 t=1.0
Input Connector CN1	(ii)	53261-0771	1	MOLEX
Output Connector CN2	(iii)	SM03(7-D1)B-BHS-1-TB(LF)(SN)	1	JST

No.	MATERIALS NAME	QU	MATERIAL	REMARK
PRODUCT NAME or MODEL, TITLE				
DC-AC INVERTER UNIT CXA-P1212D-WJL				
TDK-Lambda	NAME OF DRAWING		DRAWING No.	PAGE
	Product Drawing		CTR-3774-A	3

<The drawings may be changed without any notice.>

1-2. Connector Configuration

Input side CN1

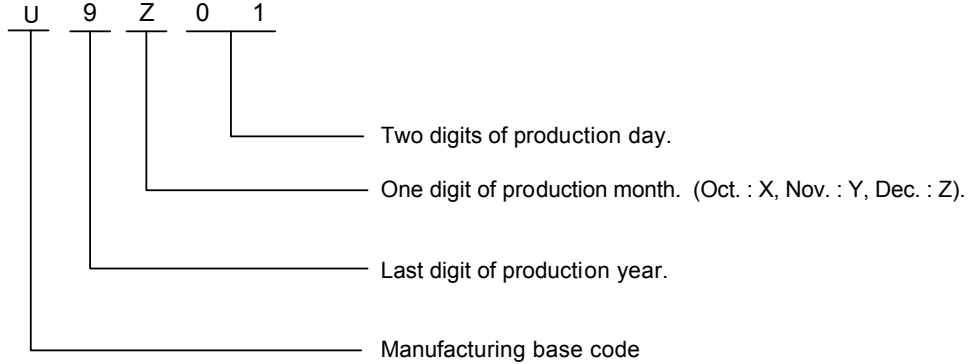
Pin No.	Symbols	Ratings	Notes
CN1-1	Vin	10.8-13.2V	Input Voltage
CN1-2			
CN1-3	GND	0V	GND
CN1-4			
CN1-5	Vrmt	0V/2.5V-Vin	0-0.4V:OFF 2.5-Vin V:ON
CN1-6	Vst	0V / 5V	The warning output 5V in abnormal circumstances
CN1-7	Vbr/Rbr	0-2.5V/0-50kΩ	Control/VR

Output side CN2

Pin No.	Symbols	Ratings	Notes
CN2-1	VHIGH1	600Vrms	Output1
CN2-2	VHIGH2	600Vrms	Output2
CN2-3	NC	-	-
CN2-4	VLOW	(2V)	Output1 Return

Note 1-1. Marking of TDK part No, Date code, Country of origin.

- 1) TDK part No., Date code, Country of origin, is marked on the board back side.
- 2) Date code example. (ex. Dec. 1. 2009)



- 3) Country of origin code example. (ex. MADE IN JAPAN. MADE IN CHINA. MADE IN MALAYSIA).

Note 1-2. For circuit connection, please refer to test circuit diagram [4].

Note 1-3. Please use minimum of 3mm clearance (all directions) between inverter high voltage area and any conductors.  
Please refer to mechanical drawing for marking of high voltage area.

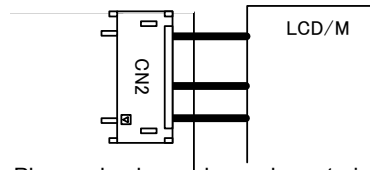
Note 1-4. Open voltage (strike voltage) is measured across the transformer secondary winding at no load as the reading at the output connector would be less than the actual value.

No.	MATERIALS NAME	QU	MATERIAL	REMARK
PRODUCT NAME or MODEL, TITLE				
DC-AC INVERTER UNIT CXA-P1212D-WJL				
<b>TDK-Lambda</b>	NAME OF DRAWING		DRAWING No.	PAGE
	Product Drawing		CTR-3774-A	4

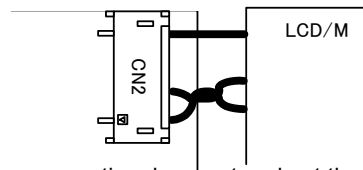
<The drawings may be changed without any notice.>

Note 1-5. If the start up voltage falls below Cold Cathode Tube strike voltage, the CCFL will not light up easily specially at lower ambient temperature. Please review mounting instruction to avoid any abnormal operation due to coupling/leakage capacitance of inverter high voltage are a to any surrounding conductor.

Figure 1. High voltage wiring  
OK



NG



Note 1-6. Please check your lamp characteristic for minimum operational current and set the limit point in your design to avoid flickering and/or abnormal operation.

Note 1-7. For proper operation of circuit protection (fuse or IC PROTECTOR), Please use minimum of 2.5A capacity for input power supply.

Note 1-8. For proper operation: Don't connect the out put VLOW(CN2-4) terminal to the input GND (CN1-3,4).

Note 1-9. Impedance from the power source or connection can cause ripple at the input voltage/current. This products includes an internal fuse rated at 1.25A. Please make sure that the ripple from the input current does not go above 1.25A.

[2]Absolute maximum ratings

Items	Symbols	Specification	Unit	Notes
Input Voltage	V <sub>in</sub>	0~15	VDC	
	V <sub>rmt</sub>	-1~V <sub>in</sub> +1		
	V <sub>br</sub>	0~16		
Load Resistance	R <sub>L</sub> //C <sub>L</sub>	100//7.5	kΩ // pF	
Operating Temp. range	T <sub>a</sub>	-30~80	°C	
Storage Temp. range	T <sub>s</sub>	-30~85	°C	
Humidity range	RH	95	%RH	A maximum wet ball temperature is 38°C No dew.

Note 2-1. The test circuits added 7.5pF capacitor across the load resistor for LCD back light stay capacitor.

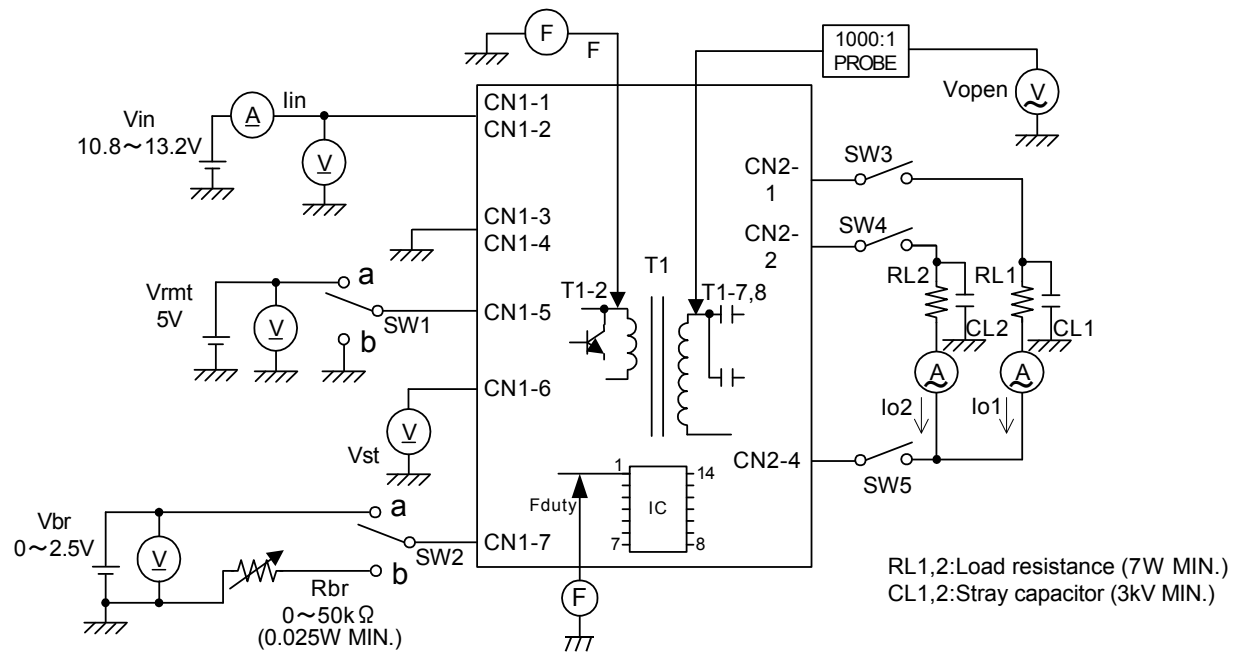
No.	MATERIALS NAME	QU	MATERIAL	REMARK
PRODUCT NAME or MODEL, TITLE				
DC-AC INVERTER UNIT CXA-P1212D-WJL				
<b>TDK-Lambda</b>	NAME OF DRAWING		DRAWING No.	PAGE
	Product Drawing		CTR-3774-A	5

<The drawings may be changed without any notice.>

[3] Electrical specifications

Item	Symbol	Conditions					Specifications			Unit
		Vin(V)	Vrmt(V)	Vbr(V)/ VR(Ω)	Ta(°C)	RL1(kΩ)//CL1(pF) RL2(kΩ)//CL2(pF)	MIN.	TYP.	MAX.	
Output Current (MAX.)	Iout1/2	12±1.2	5±0.25	0 / 0	-30~80	90// 7.5 90// 7.5	5.3	6.0	6.7	mArms
		12±0.6	5±0.25	0 / 0	23±5	90// 7.5 90// 7.5	5.5	6.0	6.5	
Output Current (MIN.)	Iout1/2	12±1.2	5±0.25	2.5 / 50k	-30~80	90// 7.5 90// 7.5	1.1	2.0	2.9	
Input Current1	Iin1	12±0.6	5±0.25	0 / 0	-30~80	90// 7.5 90// 7.5	-	0.8	1.0	A
Input Current2	Iin2	12±0.6	0±0.25	0 / 0	-30~80	90// 7.5 90// 7.5	-	-	1	mA
Frequency	F1	12±0.6	5±0.25	0 / 0	-30~80	90// 7.5 90// 7.5	38	43	48	kHz
Frequency(Duty)	F2	12±0.6	5±0.25	2.5 / 50k	-30~80	90// 7.5 90// 7.5	220	250	280	Hz
Open Circuit Voltage	Vopen	12±1.2	5±0.25	0 / 0	-30~80	∞ ∞	1500	1700	2000	Vrms
Warning Signal (Note4-4)	Vst	12±1.2	5±0.25	0 / 0	-30~80	90// 7.5 ∞	4.5	5.0	5.5	V
		12±1.2	5±0.25	0 / 0	-30~80	∞ 90// 7.5	4.5	5.0	5.5	
		12±1.2	5±0.25	0 / 0	-30~80	90// 7.5 90// 7.5	-	0	0.5	

[4] Test circuit



\*For the number of the component's position, please refer to Outline diagram [1].

No.	MATERIALS NAME	QU	MATERIAL	REMARK
PRODUCT NAME or MODEL, TITLE				
DC-AC INVERTER UNIT CXA-P1212D-WJL				
<b>TDK-Lambda</b>	NAME OF DRAWING		DRAWING No.	
	Product Drawing		CTR-3774-A	
			PAGE	6

<The drawings may be changed without any notice.>

Note 4-1.SW1 (ON/OFF) Operation is as following;

SW1	Operation of unit
a	Operation
b	Non operation
Open	Non operation

Note 4-2.SW2 (ON/OFF) Operation is as following;

SW2	Operation of unit
a	*Voltage dimming Vbr=0~2.5V
b	*Variable resistance dimming VR=0~50k $\Omega$

\*Vbr=0V:brightness MAX.  
Rbr=0 $\Omega$ :brightness MAX.

Note 4-3.Test Equipments

- (V) Digital Multiple Meter(ADVANTEST R6452A or equivalent)
- (A) DC Current Meter(ADVANTEST R6452A or equivalent)
- (F) Frequency Counter(ADVANTEST R6452A or equivalent)
- (V) True RMS Meter(NF Circuit M2170r or equivalent)
- (A) High Frequency Current Meter(FLUKE187or equivalent)

1000:1 High Voltage Probe(Tektronix P6015A or equivalent)

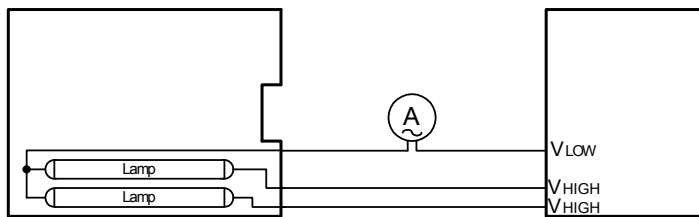
Note 4-4.Safety Function

Load Condition	*1Alarm Signal (CN1-6)	*2Shutdown Operation
Normal Operation	0.5V max.	Normal
1 Lamp Open	4.5~5.5V	Normal
2 Lamps Open	4.5~5.5V	Shutdown

\*1.When any of the load is opened, the alarm output becomes 5V.

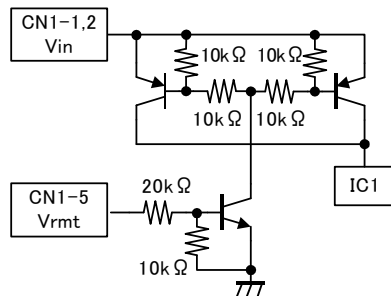
\*2.When all of the load is opened, inverter will shut down about 3 seconds.

Connection diagram of LCD module (Reference)  
LCD module



\*Connect the High Frequency Current Meter to the Low-Voltage (VLow) side.

Vrmt terminal circuit (Reference)



No.	MATERIALS NAME	QU	MATERIAL	REMARK
PRODUCT NAME or MODEL, TITLE				
DC-AC INVERTER UNIT CXA-P1212D-WJL				
NAME OF DRAWING		DRAWING No.		PAGE
Product Drawing		CTR-3774-A		7

**TDK-Lambda**

<The drawings may be changed without any notice.>



[5] Reliability test

Following test items are assured.

Items	Conditions	Judgement
Low Temp.Non operational	-30°C 500h	Electrical and apperance should be in the spec.
Low Temp.operational	-20°C 500h Load cond.:TYP	
High Temp.Non operational	85°C 500h	
High Temp.operational	70°C 500h Load cond.:TYP	
Heat shock	-30°C to 80°C 30min.Each 100 Cycles	
Humidity (Non operational)	60°C 90~95%RH 500h	
Vibration	10~57Hz Amplitude 0.75mm 58~500Hz 9.8m/s <sup>2</sup> Sweep:11min 60min each axis X,Y,Z	
Shock	980m/s <sup>2</sup> 11ms Harf-sine pulse 1 time each axis ±X,Y,Z	

No.	MATERIALS NAME	QU	MATERIAL	REMARK
PRODUCT NAME or MODEL, TITLE				
DC-AC INVERTER UNIT CXA-P1212D-WJL				
NAME OF DRAWING		DRAWING No.		PAGE
Product Drawing		CTR-3774-A		8

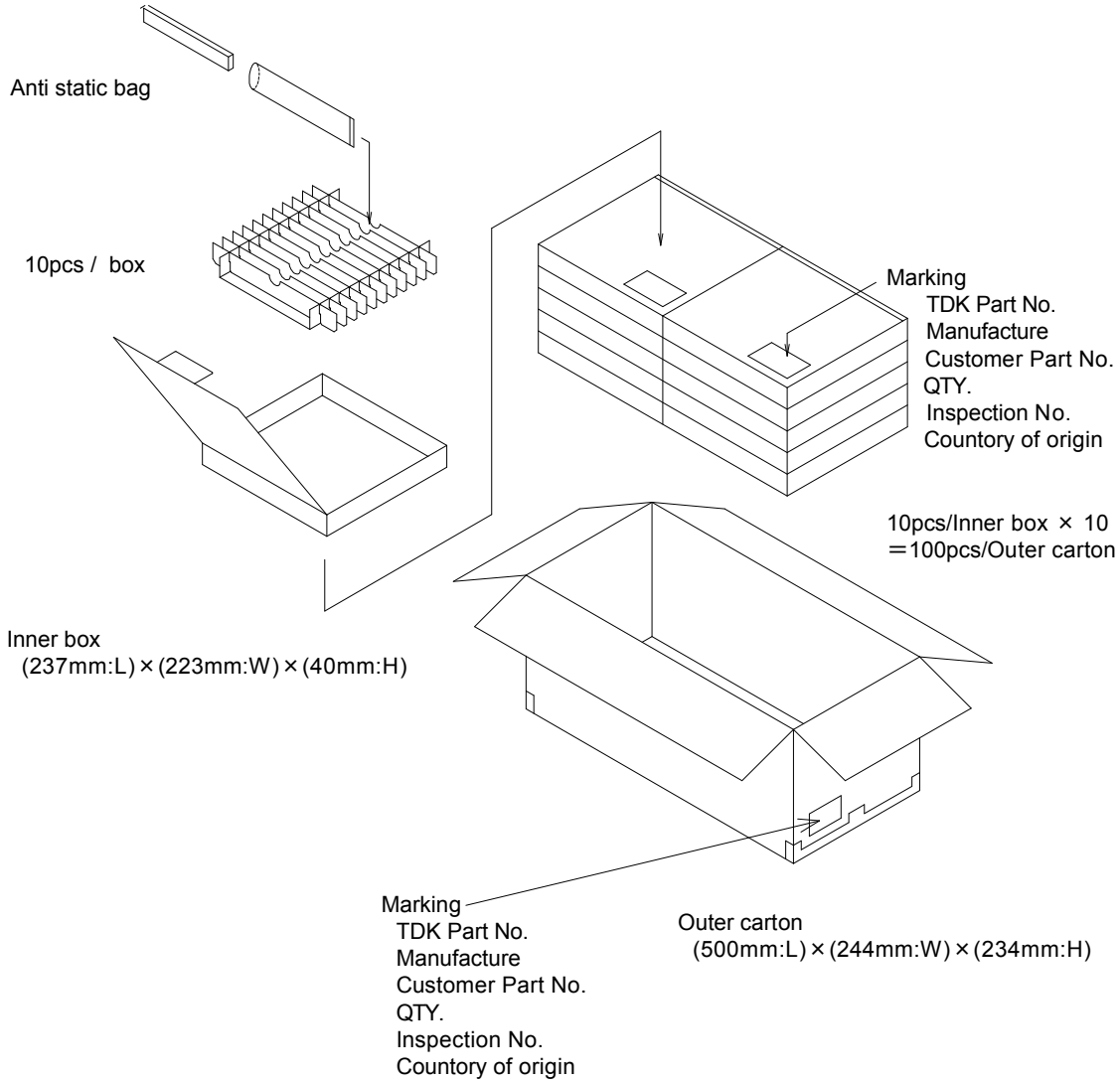
**TDK-Lambda**

<The drawings may be changed without any notice.>

[6] Packing and Marking

A shipping box is packaged to avoid from water or damage. Following items are printed on the box.

- 6-1. TDK part No. CXA-P1212D-WJL
- 6-2. Manufacture
- 6-3. Customer part No.
- 6-4. QTY.
- 6-5. Inspection No.
- 6-6. Country of origin



[7] Others

7-1. Test cond.  
A normal test condition :Temperature (20±15°C), Humidity (65±20%RH).

7-2. Std warantry  
One year after shipment.This covers any defects in material or workmanship.  
Defective units will be replaces at no charge.

7-3. Others  
TDK and customer are to discuss changes,problems, and modifications and etc, when needed.

No.	MATERIALS NAME	QU	MATERIAL	REMARK
PRODUCT NAME or MODEL, TITLE				
DC-AC INVERTER UNIT CXA-P1212D-WJL				
<b>TDK-Lambda</b>	NAME OF DRAWING		DRAWING No.	PAGE
	Product Drawing		CTR-3774-A	9

<The drawings may be changed without any notice.>