

**MESSRS :**

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**Product Drawing**

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CUSTOMER'S PRODUCT NAME:

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TDK PRODUCT NAME: DC/AC INVERTER UNIT  
CXA-0474

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***TDK-Lambda***

**TDK Corporation**

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DWG.No.	CTR-2611-X
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## 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.
- 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.
- 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.

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1. Part Name

The part name is CXA-0474.

2. Contents

Item	Attached view	Page
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Listed description are subject to change without notice.

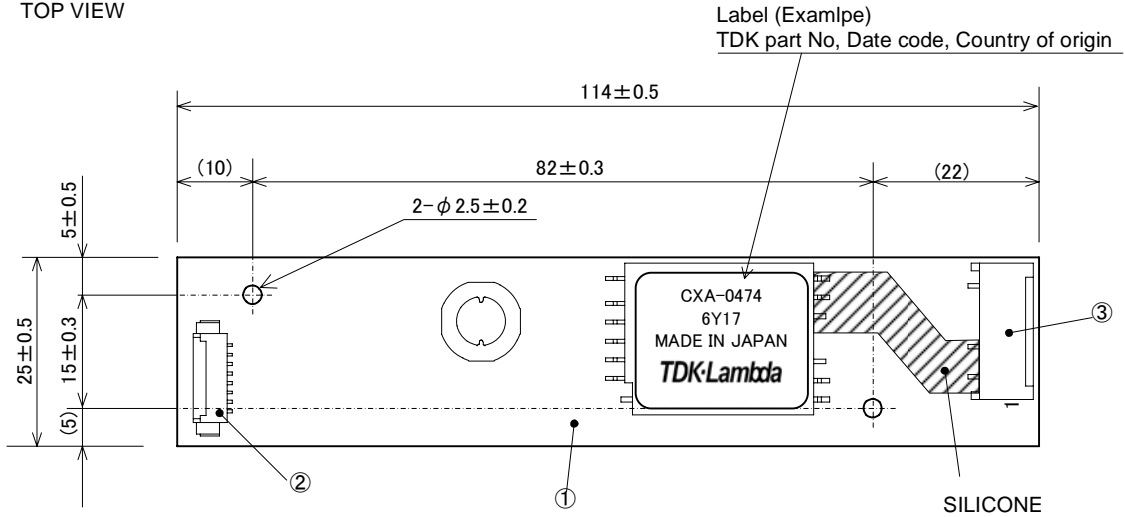
●Features●

- 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.
- With lamp failure detector.  
Normal Operation : CN1-8=0V  
Some Lamps Open : CN1-8=5V
- Select the way of dimming (between CN1-6 and CN1-7)
  1. Insert a potentiometer (0-10k $\Omega$ )
  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.

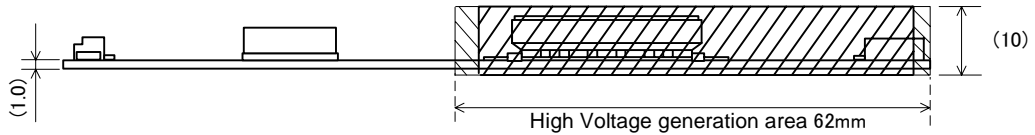
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[1] Outline  
1-1. Outline

TOP VIEW



SIDE VIEW



\*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.

BOTTOM VIEW



Unit:mm

Symbols	Product name	Material	Quantity	Remark	Mates With
①	PCB	Composite (CEM-3)	1	UL94V-0 t=1.0	-
②	CN01	53261-0871	1	(MOLEX)	51021-0800
③	CN02	SM03(7-D1)B-BHS-1-TB(LF)(SN)	1	(JST)	BHR-04VS-1

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## 1-2. Connector Configuration

### Input side CN1

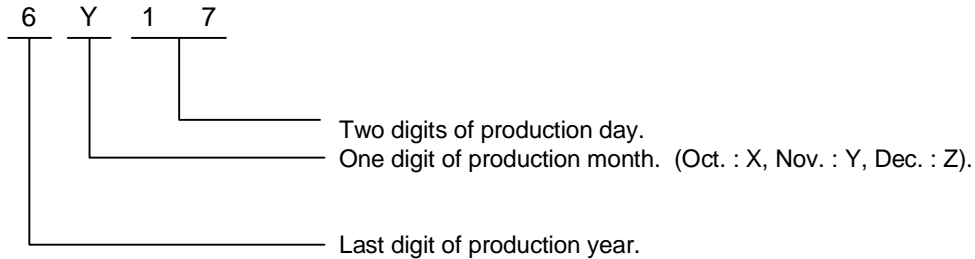
Pin No.	Symbols	Ratings	Notes
CN01-1	Vin	11.4 ~ 12.6V	Input Voltage
CN01-2			
CN01-3	GND	0V	GND
CN01-4			
CN01-5	Vrmt	0V/2.5V ~ Vin	Remote terminal 0 ~ 0.4V:OFF 2.5V ~ Vin V:ON open:ON
CN01-6	Rbr1/Vbr	0 ~ 2.5V /0 ~ 10kΩ	Control terminal 1
CN01-7	Rbr2	0 ~ 10kΩ	Control terminal 2
CN01-8	Vst (Out Put)	0V/5V	Alarm output 5V when lamps are open

### Output side CN2

Pin No.	Symbols	Ratings	Notes
CN02-1	CFL HOT	600Vrms	Out put1
CN02-2	CFL HOT	600Vrms	Out put2
CN02-3	NC	-	-
CN02-4	CFL COLD	(2V)	Out Put1,2 RETURN

Note1-1. Marking of TDK part No, Date code, Country of origin.

- 1) TDK part No., Date code, Country of origin, is marked on the transformer.
- 2) Date code example. (ex. Nov.17 . 2006)



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

Note1-2. For circuit connection, please refer to test circuit diagram [4].

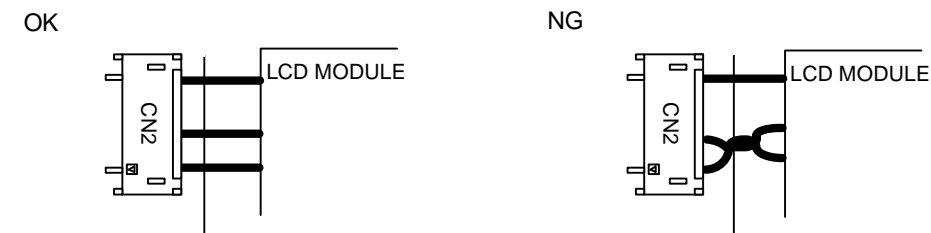
Note1-3. Please use minimum of 3mm clearance (all directions) between inverter high voltage area and any conductors. Please refer to mechanical drawing for marking of high voltage area.

Note1-4. 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.

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Note1-5. 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 area to any surrounding conductor.

fig1.High Voltage Code



Note1-6. Please check your lamp characteristic for minimum operational current and set the limit point in your design to avoid flickering and/or abnormal operation.

Note1-7. For proper operation of circuit protection (fuse or IC PROTECTOR), Please use minimum of 2A capacity for input power supply.

Note1-8. For proper operation: Don't connect the out put VLOW(CN2-4) terminal to the input GND(CN1-3,4).

[2] Absolute Maximum Ratings

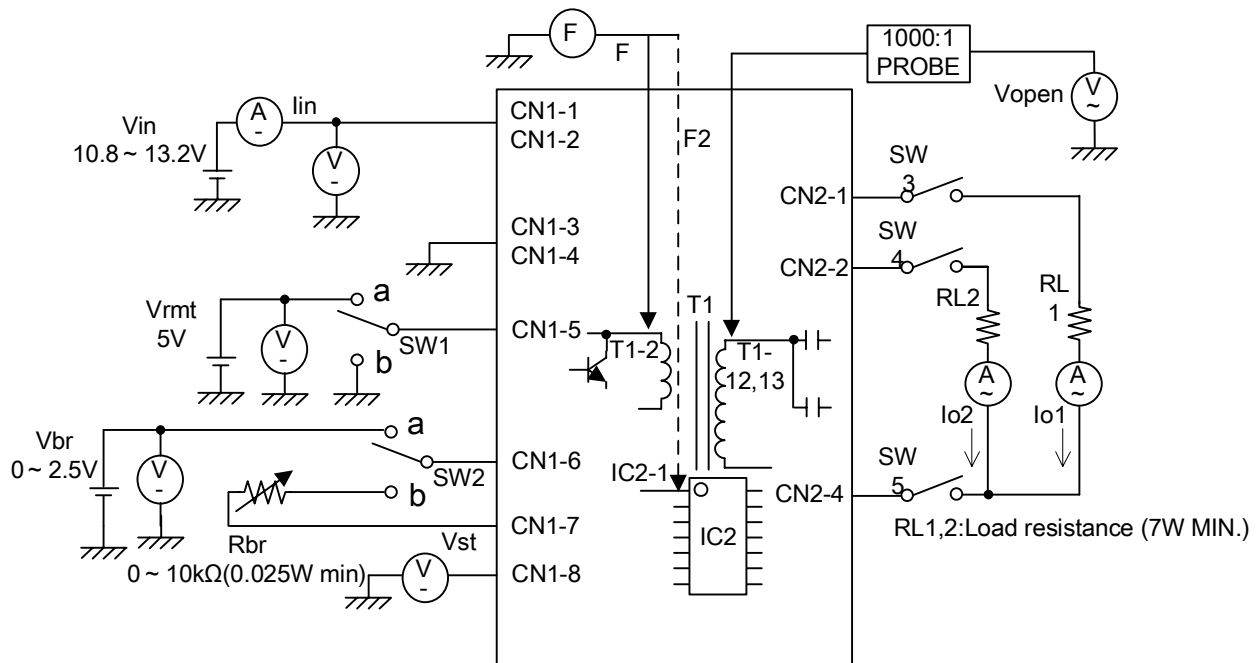
Items	Symbols	Specification	Unit	Notes
Input Voltage	V <sub>in</sub>	0~14	V	-
	V <sub>rmt</sub>	-1~V <sub>in</sub> +1		
	V <sub>br</sub>	0~16		
Output Power	R <sub>L</sub>	120	kΩ	-
Operating Temp. range	T <sub>a</sub>	-10~70	°C	-
Storage Temp. range	T <sub>s</sub>	-30~85	°C	-
Humidity range	RH	95	%RH	A maximum wet ball temperature is 39°C

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[3] Electrical specifications

Item	Symbol	Conditions					Specifications			Unit
		Vin(V)	Vrmt(V)	Rbr(kΩ)/ Vbr(V)	Ta(°C)	RL1(KΩ) RL2(KΩ)	MIN.	TYP.	MAX.	
Output Current (Brightness max.)	Io1/2	12±0.6	5±0.25	10 / 2.5	-10 ~ 70	110 110	4.5	5.0	5.5	mArms
Output Current (Brightness min.)	Io1/2	12±0.6	5±0.25	0 / 0	-10 ~ 70	110 110	1.5	2.5	3.5	
Input Current1	Iin1	12±0.6	5±0.25	10 / 2.5	-10 ~ 70	110 110	-	0.6	1.0	A
Input Current3	Iin2	12±0.6	0±0.25	10 / 2.5	-10 ~ 70	110 110	-	-	1	mA
Frequency	F1	12±0.6	5±0.25	10 / 2.5	-10 ~ 70	110 110	63.5	67.5	72.0	kHz
Frequency	F2	12±0.6	5±0.25	0 / 0	-10 ~ 70	110 110	241	255	268	Hz
Open Circuit Voltage	Vopen	11.4 min.	5±0.25	10 / 2.5	-10 ~ 70	∞ ∞	1.75	1.85	1.95	kVrms
Warning Output	Vst	12±0.6	5±0.25	10 / 2.5	-10 ~ 70	110 ∞	4.5	5.0	5.5	V
		12±0.6	5±0.25	10 / 2.5	-10 ~ 70	∞ 110	4.5	5.0	5.5	
		12±0.6	5±0.25	10 / 2.5	-10 ~ 70	110 110	-	0	0.5	

[4] Test Circuit



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

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

SW1	Operation of unit
a	Operation
b	Non operation
Open	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=0~10k Ω

\*Vbr=2.5V:brightness MAX.  
Rbr=10kΩ:brightness MAX.

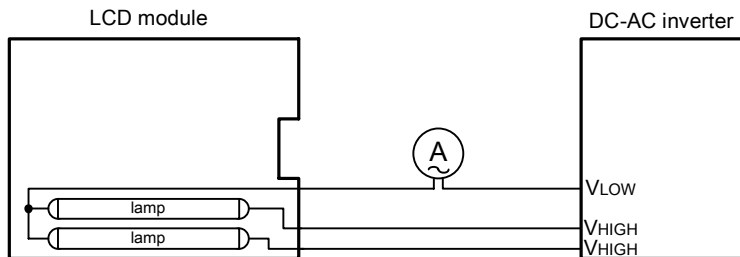
Note4-3.Safety Function

Load Condition	Alarm Signal (CN1-6) <sup>*1</sup>	Shutdown Operation <sup>*2</sup>
Normal Operation	0.5V max.	Normal
1 Lamp Open	4.75~5.25V	Normal
2 Lamps Open	4.75~5.25V	Shutdown

\*1 In test circuit[4] ,if CN2 or CN3 opens, then the warning signal will be activated (+5V).  
\*2 If the inverter detects open circuit all of the lamps for more than 3 seconds it will shut down.

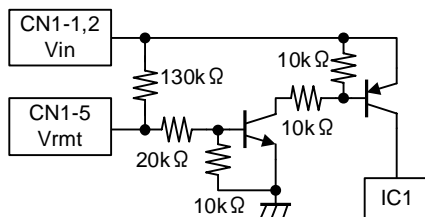
- (V) Digital Multiple Meter(ADVANTEST R6451A or equivalent)
- (A) DC Current Meter(ADVANTEST R6451A or equivalent)
- (F) Frequency Counter(ADVANTEST R6452A or equivalent)
- (V) True RMS Meter(KEITHLEY 2001 or equivalent.)
- (A) High Frequency Current Meter(KEITHLEY 2001 or equivalent)
- 1000:1 High Voltage Probe (Tektronix P3000 or equivalent)

Connection diagram of LCD module (Reference)



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

Remote terminal circuit (Reference)



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[5] Reliability Test

Following test items are assured.

Items	Conditions	Judgement
Low Temp.Non operational	-30°C 500h	Electrical and apperrance should be in the spec.
Low Temp.operational	-10°C 500h	
High Temp.Non operational	85°C 500h	
High Temp.operational	70°C 500h	
Heat shock	-30°C⇔85°C 30min.Each 100 Cycles	
Humidity (Non operational)	60°C 95%RH 500h	
Vibration	10~57Hz Amplitude 58~500Hz19.6m/s <sup>2</sup> Sweep:11min 120min each axis X,Y,Z	
Shock	980m/s <sup>2</sup> 11ms Harf-sine pulse 5 time each axis ±X,Y,Z	

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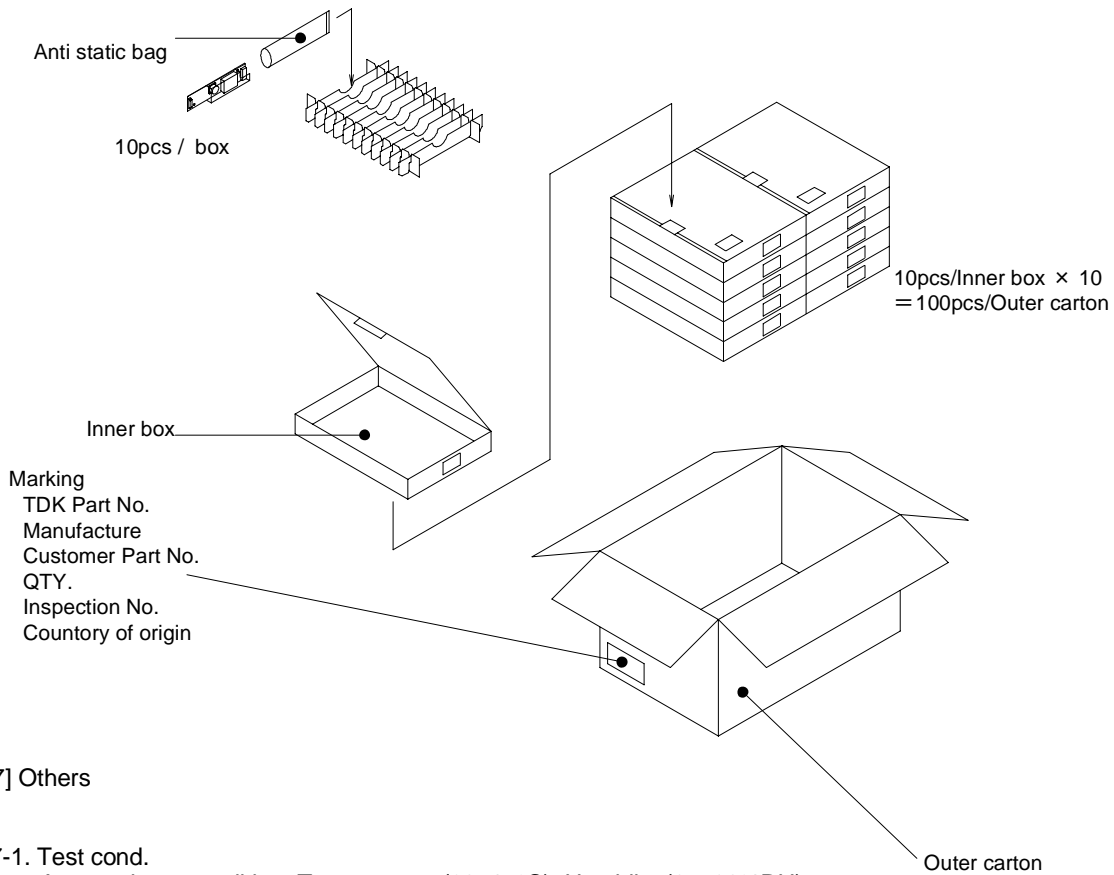
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[6] Packing and Marking

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

- 6-1. TDK part No. CXA-0474
- 6-2. Manufacture TDK
- 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 warrantry

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

7-3. MTTF

MTTF which calculated according to MIL-HDBK-217-F is as follows.

TEMPERATURES 25°C  
 MTTF 1400000 hours or more

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