



NDK Series  
Control Transformer

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# User Instruction

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## Safety Warning

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- ① Only professional technicians are allowed for installation and maintenance;
- ② Installation in any damp, condensed environment with inflammable and explosive gas is forbidden;
- ③ When the product is being installed or maintained, the power must be switched off;
- ④ You are prohibited from touching the conductive part when the product is in operation.



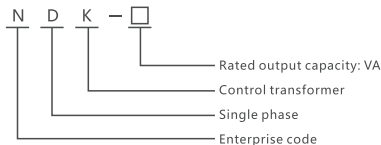
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## 1 Use Purpose

NDK series control transformer (hereinafter referred to as the transformer) is applicable to the AC circuit of 50Hz/60Hz with rated power supply voltage of 690V and below. It is used as the control power supply of machine tools and mechanical equipment, the power supply of working lighting, electronic equipment and signal lights, and also as a miniature power supply.

## 2 Type Designation



## 3 Normal Operation, Installation and Transportation and Storage Conditions

### 3.1 Operation conditions

The upper limit of ambient air temperature is 40 °C, and the lower limit of ambient air temperature is - 5 °C. When the maximum temperature is 40 °C, the relative humidity of air must not exceed 50%, and a higher relative humidity is allowed at a lower temperature, e.g. 90% at 20 °C. Special measures should be taken for condensation occasionally caused by temperature change. The altitude of the installation site must not exceed 2,000m.

### 3.2 Installation conditions

The transformer with rated capacity  $\leq 1000\text{VA}$  should be mounted horizontally or vertically; the transformer with rated capacity  $> 1000\text{VA}$  can be

mounted horizontally only. The installation site should be free from shaking and shock.

### 3.3 Transportation and storage conditions

The transformer must be placed upright during transportation, protected from rain, water and snow and free from severe vibration and impact. The transformer must be stored in an environment where there is no rain or snow, the air circulation is good, there is no exposure to sunlight or corrosive gases, the relative humidity (at 25 ° C) is not greater than 95%, and the temperature is between -25 ° C and 55 ° C.

## 4 Main Technical Parameters

4.1 See Table 1 for the main technical parameters of the transformer

**Table 1 Main Technical Parameters**

No.	Main Technical Parameters	
1	Rated capacity	25VA~20kVA
2	Rated frequency	50Hz, 60Hz
3	Rated supply voltage V	220, 380, 660, 690
4	Rated output voltage V	6, 12, 24, 36, 110, 127, 220, 380, 660, 690

Notes:

1. The rated supply voltage and rated output voltage listed shall be properly combined as required. The rated output voltage can also be a lower rated output voltage obtained from the higher rated output voltage windings by means of shunting tapping.
2. The voltage outside the table shall be determined by the user and the manufacturer.
3. 3. At each rated output voltage, the distribution of rated output capacity shall be determined according to user requirements.

### 4.2 Principle of coil winding

4.2.1 Multi winding and multi tap: Draw the required voltage on the input and output windings by means of tap. This kind of transformer shall be used in accordance with the rules of No.1 and No. 2 in Table 2 of the user instructions to avoid accidents caused by misoperation.

4.2.2 When the input and output of the transformer each have only one winding, the output end can reach the rated output capacity. See No.3 in Table 2 for the use example. If the output has multiple windings, each winding shall bear the corresponding load according to the allocated capacity. See No.4 in Table 2 for the use example.

**Table 2 Transformer Use Example**

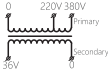
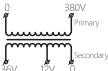
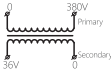
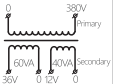
No.	Example
1	<p>1 Model NDK-100, rated capacity 100VA, input 380V 220V, output 36V:</p> <p>1) Rated input current = <math>100\text{VA}/380\text{V} = 0.263\text{A}</math>. Because 220V is the center tap, i.e. the input current shall not exceed 0.263A no matter it is 380V or 220V input.</p> <p>2) When 380V is input, the total output capacity is <math>380\text{V} \times 0.263\text{A} = 100\text{VA}</math>;</p> <p>When 220V is input, the total output capacity is <math>220\text{V} \times 0.263\text{A} = 58\text{VA}</math>.</p> <p>3) When 380V is input, the rated output current = <math>100\text{VA}/36\text{V} = 2.78\text{A}</math>;</p> <p>When 220V is input, the rated output current = <math>58\text{VA} / 36\text{V} = 1.61\text{A}</math> (i.e.: no matter how many center tap voltages the input has, the output end can reach the rated capacity only when the highest voltage is input)</p> 
2	<p>Model NDK-100, rated capacity 100VA, input 380V, output 36V 12V:</p> <p>1) Rated input current = <math>100\text{VA}/380\text{V} = 0.263\text{A}</math>.</p> <p>2) Rated output current = <math>100\text{VA}/36\text{V} = 2.78\text{A}</math>. Since 12V is the tap voltage in the center of the output winding, the maximum current is also 2.7A when 12V is used alone. If 12V and 36V are used together, the sum of the output current cannot be greater than 2.78A either. (i.e.: the total output current cannot exceed the rated output current of the transformer regardless of whether the output voltage is used alone or in combination of two or more.)</p> 

Table 2 continued

No.	Example
3	<p>Model NDK-100, rated capacity 100VA, input 380V, output 36V:</p> <p>1) Rated input current = <math>100\text{VA}/380\text{V} = 0.263\text{A}</math>.</p> <p>2) Rated output current = <math>100\text{VA}/36\text{V} = 2.78\text{A}</math>.</p> <p>Since the input and output each have only one winding and there is no tap voltage in between, the output voltage of 36V can bear the rated capacity of 100 VA (i.e., the output end can reach the rated capacity when the input and output of the transformer each have only one winding).</p> 
4	<p>Model NDK-100, rated capacity 100VA, input 380V, output 36V (60VA) 12V (40VA):</p> <p>1) Rated input current = <math>100\text{VA}/380\text{V} = 0.263\text{A}</math>.</p> <p>2) The rated output current at 36V output = <math>60\text{VA}/36\text{V} = 1.67\text{A}</math>.</p> <p>3) The rated output current at 12V output = <math>40\text{VA}/12\text{V} = 3.33\text{A}</math></p> <p>Since the input has only one winding and the output has two separate independent windings, and the capacity of each output winding has been assigned, then each output winding can bear the corresponding rated assigned capacity, i.e. 36V can bear 60VA and 12V can bear 40VA (i.e. since the output winding of the transformer is allocated with capacity, its primary winding is not allowed to have a mid-point tap).</p> 

## 5 Overall and Mounting Dimensions

See Figures 1-4 for the outlines of the transformers and see Table 3 for the overall and installation sizes.

**Table 3 Overall and Installation Sizes of the Transformers**

Model	Outline Size mm			Installation Size mm		Mounting Houle mm	
	Bmax	Dmax	Emax	A	C	K	J
NDK-25	80	83	82	65	50	5	8
NDK-50	85	89	84	70	58	6	10
NDK-100	103	93	99	85	64	6	10
NDK-150	103	100	99	85	72	6	10
NDK-200	103	112	99	85	83	6	10
NDK-250	130	130	135	100	80	8	11
NDK-300	130	135	135	100	84	8	11
NDK-400	148	155	153	110	114	8	11
NDK-500	148	155	153	110	114	8	11
NDK-700	173	158	168	125	100	8	11
NDK-1000	173	180	168	125	113	8	11
NDK-1500	265	190	270	220	112	10	20
NDK-2000	265	200	280	220	120	10	20
NDK-2500	265	210	280	220	132	10	20
NDK-3000	265	220	305	220	142	10	20
NDK-4000	315	240	305	260	162	10	20
NDK-5000	315	260	305	260	182	10	20
NDK-6k	360	320	390	220	179	10	20
NDK-7k	360	320	390	220	179	10	20
NDK-8k	360	360	390	220	219	10	20
NDK-10k	360	360	390	220	219	10	20
NDK-15k	410	380	460	280	218	10	20
NDK-20k	410	405	490	280	232	10	20

Note: The overall and installation sizes are subject to the change without further notice. The data in the table are for reference only.

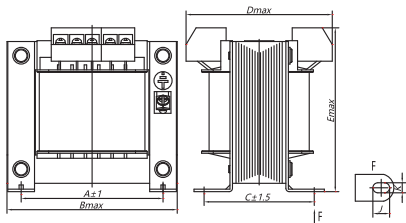


Figure 1 Overall Size of NDK-25~200 Product

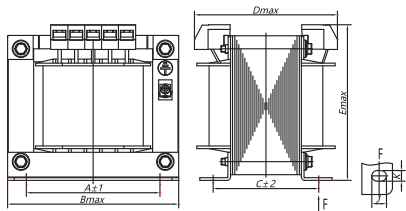


Figure 2 Overall Size of NDK-250~1000 Product



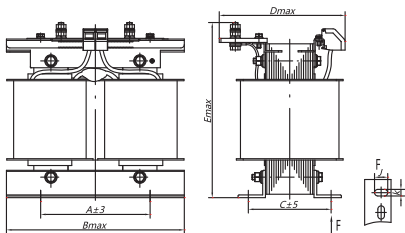


Figure 3 Overall Size of NDK-1500~5000 Product

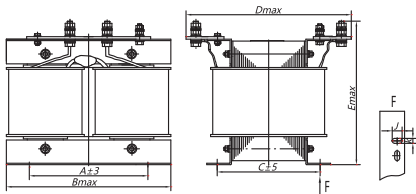


Figure 4 Overall Size of NDK-6k~20k Product

## **6 Installation, Commissioning and Operation**

**6.1** Carefully check whether the parameters on the transformer nameplate are consistent with the parameters of the load before installation.

**6.2** Before use, it is necessary to test whether the grid voltage is the rated input voltage of the transformer, with the allowable deviation of 5%; if it exceeds this range, the front end should be added with a regulated power supply.

**6.3** The installation site shall meet the requirements of normal working and installation conditions specified in Article 3 to ensure that the product is free from vibration and erosion.

**6.4** Connect wires according to the identification. Check and make sure the wiring is correct before power connection and use.

## **7 Maintenance, Lifting and Storage**

**7.1** Avoid collision and extrusion during the transportation and keep it dry; please pay attention to maintenance when using.

**7.2** Cut off the power when the product needs to be maintained. The operation can only be carried out by professionals.

**7.3** The transformer must be protected from moisture and mildew when stored.

**7.4** If you need to lift the transformer carrying with rings, please confirm the correct and secure installation of the rings before the lifting operation and pay attention to safety precautions to avoid accidents.

## 8 Troubleshooting

Table 4

Fault	Cause analysis	Troubleshooting method
The transformer smokes or the temperature rise is too high.	1. The capacity of the load electrical equipment exceeds the rated capacity of the transformer (overload). 2. The input voltage is too high.	1. Cut off the power supply, stop using the transformer, or reduce the load. 2. Adjust the input voltage to the rated value.
The deviation between the actual output voltage and the nominal output voltage is large.	1. The input power supply voltage of the transformer is not stable. 2. The power supply voltage is inconsistent with the rated input voltage of the transformer, with a large deviation.	1. Add a regulated power supply device at the power input end of the transformer to stabilize the power supply voltage. 2. Replace with the transformer with a rated input voltage that is consistent with the supply voltage.
There is no output voltage after the transformer is powered on.	1. Power supply voltage failure. 2. The wire connecting the power supply at the input end of the transformer has loosened and is not firmly connected. 3. The winding or tap of transformer coil is broken.	1. Check if the power supply voltage is normal. 2. Check if the wires connecting the power supply and the input terminals of the transformer are securely connected. 3. Check if the transformer coil is intact and if the tap wire of the winding connecting terminal is broken or has unsoldering.

Table 4 continued

Symptoms	Cause analysis	Troubleshooting method
Obvious noise.	1. It is a normal phenomenon that the transformer has electromagnetic sound when it works with load. 2. In case of obvious vibration or abnormal noise, the core clamp of the product may have loosened due to the transportation vibration, and the noise may be caused by the mutual vibration between the core plates during operation. 3. The power supply voltage is too high, causing the magnetic saturation of the core to generate noise. 4. The electrical resonance around the transformer causes noise on the cabinet housing.	1. Check and retighten the core to make the core plates fit closely. 2. Adjust the power supply voltage to be consistent with the input voltage of the transformer.

## 9 Ordering Instructions

Please specify the following items when placing an order:

- 1) The model, specification, capacity and quantity of the transformer.
- 2) The rated input voltage and rated output voltage of the transformer and the capacity distribution of each group of output voltage.

## 10 Environmental Protection

In order to protect the environment, the product or product parts should be disposed of according to the industrial waste treatment process, or be sent to the recycling station for assortment, dismantling and recycling.

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**QC PASS**

NDK Series  
Control Transformer  
IEC61558-2-2: 2007

Check 15

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Test date: Please see the packing

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**ZHEJIANG CHINT ELECTRICS CO., LTD.**

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**CHNT**

CHINT ELECTRICS

NDK Series  
Control Transformer  
User Instruction

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