



# BK Series Control Transformer User Manual

Standard: Q/DLX 361

□ Please carefully read this User Manual before installing and operating the product, and keep this manual properly for future reference

## 1. Overview

1.1 BK series control transformer (hereinafter referred to as transformer) has advantages of excellent performance, reliable operation, and wide applicability, and it is usually used in the mechanical equipment as the power supply for electrical control, lighting and indicator light.

1.2 Product standard: Q/DLX361

## 2. Ambient Temperature

2.1 The altitude does not exceed 2000m.

2.2 Ambient air temperature: the maximum temperature does not exceed 40°C, and the minimum temperature is not below -5°C.

2.3 Relative air humidity: The average monthly maximum relative humidity of the wettest month is 90%, and the average monthly temperature of that month is +25°C.

2.4 Installed in places where there are no harsh vibrations or bumps.

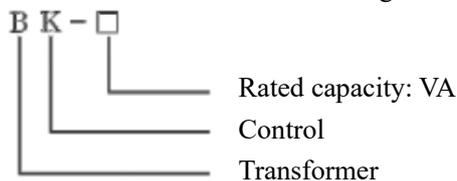
2.5 Installed in places where there is no explosive medium or the medium does not contain gas or conductive dust that causes metal corrosion or damage to the insulation.

2.6 Installed in places free from rain or snow.

2.7 The power supply voltage waveform is similar to a sine wave.

## 3 Model and Basic Parameters

3.1 Product model and its meanings



3.2 Transformer structure type

3.2.1 Transformers are divided into various specifications according to their different capacities and voltages, but they are all transformers with single-phase multi-winding and with primary and secondary coupling wound separately each other.

3.2.2 The coil of this series of transformers can accommodate all rated capacities when there is only one winding in the primary and secondary winding; if there are multiple windings, each winding shall carry the given capacity; however, the sum of the capacities of all windings shall not exceed the total capacity, as illustrated in Fig. 1, Fig. 2, Fig. 3 and Fig. 4.

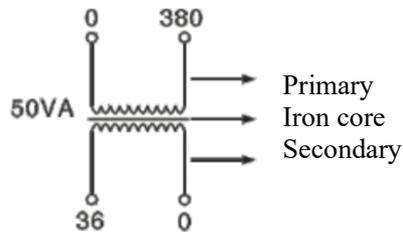


Fig. 1 Single winding

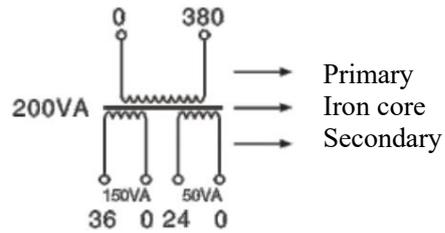


Fig. 2 Discrete winding

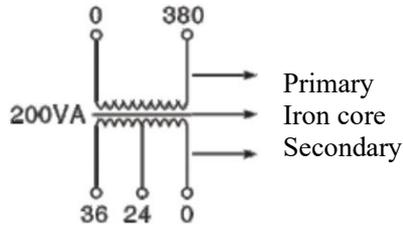


Fig. 3 Hybrid winding

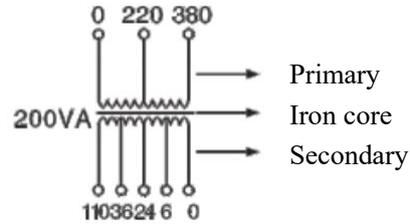


Fig. 4 Continuous winding with a center tap

### 3.2.3 3.2.3 For example

3.2.3.1 The Fig. 1 shows that for BK-50 type, the capacity is 50VA, the input voltage is 380V, and the output voltage is 36V, because the primary and secondary sides have only one winding, and this winding can carry full capacity of 50VA.

3.2.3.2 For example, Fig. 2 shows that for BK-200 type, the capacity is 200VA, the input voltage is 380V, and the output voltage is 36V, 150VA and 24V, 50VA. Because the primary side has only one winding, this winding shall carry the rated capacity 200VA, and the secondary side has two separate single windings, and the capacity of each winding has been indicated and they can carry their own capacity respectively, but the total capacity is 200VA.

3.2.3.3 For example, Fig. 3 shows that for BK-200 type, the capacity is 200VA, the input voltage is 380V, and the output voltage is 36V, 24V. Because the primary side has only one winding, the capacity of this winding is the rated capacity 200VA; there is a center tap in the secondary winding, so that only when the maximum voltage 36V of the secondary side is used separately, the 200VA load can be carried. If there is 24V, the 200VA load cannot be carried, but only 133VA load is carried. Because the total current on the secondary side is  $I_2 = \frac{P_e}{U_2} = \frac{200VA}{36V} = 5.55A$ , the capacity when the 24V is used separately is  $24V = 24V * 5.55A = 133VA$ . when 36V and 24V are both used, the sum of the currents shall not be greater than 5.55A. In a word, regardless of whether the output voltage is used separately or two sets are used simultaneously, the sum of the load currents cannot exceed the rated current of the transformer.

3.2.3.4 For example, Fig. 4 shows that for BK-200 type, the capacity is 200VA, the input voltage is 380V, 220V, and the output voltage is 110V, 36V, 24V, 6V. Fig. 4 shows that there is a center tap in primary and secondary windings. The maximum operating current of the primary winding is  $I_1 = \frac{P_e}{U_2} = \frac{200VA}{380V} = 0.526A$ , so regardless of whether the 220V or 380V is used, its current cannot exceed 0.526A; even when the 380V is used, the capacity of this transformer is 200VA; when the 220V is used, the maximum capacity of this transformer is  $\frac{200VA}{380V} \times 220V = 116VA$ , so that a 200VA transformer becomes a 116VA transformer; at the same time, the secondary capacity is reduced to 116VA. The maximum working current of the secondary winding depends on the working situations of the primary winding; if the primary winding is connected to the 380V power supply, at this time the voltage of the transformer shall be 200VA, so that the current of the secondary winding shall be  $I_2 = \frac{P_e}{U_2} = \frac{200VA}{110V} = 1.8A$ .

When 110V is used separately, the capacity is  $110V \times 1.8A = 200VA$

When 36V is used separately, the capacity is  $36V \times 1.8A = 65VA$

When 24V is used separately, the capacity is  $24V \times 1.8A = 43VA$

When 6V is used separately, the capacity is  $6V \times 1.8A = 11VA$

When two or more sets of output voltages are used simultaneously, the sum of their currents must not be greater than 1.8A. If the primary winding is connected to the 220V voltage, the voltage of the transformer shall be 116VA rather than 200VA. Therefore, the current of the secondary winding is  $I_2 = \frac{P_e}{U_2} = \frac{116VA}{110V} = 1.05A$ .

When 110V is used separately, the capacity is 110V x 1.05A = 116VA

When 36V is used separately, the capacity is 36V x 1.05A = 38VA

When 24V is used separately, the capacity is 24V x 1.05A = 25VA

When 6V is used separately, the capacity is 6V x 1.05A = 6.3VA

When two or more sets of voltages are used simultaneously, the sum of their currents must not be greater than 1.05A.

#### 4 Outline Dimensions and Installation Dimensions

BK series		
Capacity (VA)	Overall dimensions: LxWxH(mm)	Installation dimensions: Lx W (mm)
25	78x67x88	56x48
50	78x67x88	56x48
100	84x79x91	64x63
150	102x85x107	76x65
200	102x91x107	76x70
250	120x105x124	90x77
300	120x111x124	90x84
400	132x117x135	110x93
500	132x124x137	110x98
600	132x124x137	110x98
700	150x130x150	110x107
800	150x135x150	110x112
1000	150x140x150	110x117
1200	180x205x187	150x131
1500	180x205x187	150x131
2000	180x228x187	150x148
2500	192x252x195	160x163
3000	192x255x195	160x163
4000	240x268x235	180x167
5000	240x286x235	180x167
6000	240x306x235	180x187
7000	240x306x235	180x187
8000	300x263x288	240x167
10000	300x273x288	240x177

## 5 Operation Instructions

5.1 Open the packing box, take out the manual and transformer, and carefully read the User Manual for proper operation.

5.2 The transformer is reliably fixed in the appropriate position to prevent vibration and erosion.

5.3 Before use, test whether the circuit and grid voltages are rated input voltages, and the allowable deviation is  $\pm 5\%$ ; if greatly out of this range, it is considered to provide a voltage regulator at the front end to ensure the reliable and normal operation of the transformer.

5.4 Select the wire with an appropriate cross-sectional area, connect the wire according to the mark, and turn on the power after passing the inspection, so that the transformer can work normally. The nominal cross-sectional area of the power cord is listed in the table below.

Input current at the rated output I, A	Nominal cross-sectional area mm <sup>2</sup>
$I \leq 6$	0.75
$6 < I \leq 10$	1.00
$10 < I \leq 16$	1.50
$16 < I \leq 25$	2.50
$25 < I \leq 32$	4.00
$32 < I \leq 40$	6.00
$40 < I \leq 63$	10.00

## 6. Precautions

6.1 Before purchase, estimate the total capacity of the electrical appliances you use, and select the transformer with a certain capacity by reference with the structure shown in Fig. 1 to Fig. 4 to ensure that the transformer is not burnt at the instant start.

6.2 This transformer is designed and produced in strict accordance with relevant national standards. When a transformer with multiple tap voltage is used, the calculation described in Section 3.2.4.4 Example is required; no matter which transformer you use, the sum of its current cannot exceed the rated current of the transformer.

6.3 Before use, please carefully check whether various data marked on the nameplate and accessory instructions meet your requirements, and power on the product after confirming that those parameters are correct.

6.4 After power-on, the transformer core and coil will heat up (but the temperature rise does not exceed 80K), and this is a normal phenomenon. If the temperature rise exceeds 80K, or even the smoke rises, please cut off the power supply, and re-check the capacity of the electrical appliance you use, and adjust it if necessary.

6.5 During transportation, avoid the collision as much as possible, and keep away from moisture. In use, maintenance is required to ensure the service life of the transformer.

6.6 Before use, this series of transformers must be reliably grounded.

## **7. Ordering Notice**

When purchasing a product, please clearly specify the following items:

7.1 Select an appropriate product according to the model, specification, capacity, primary and secondary voltage, and capacity allocation of the secondary voltage or by reference with the examples shown in Fig. 1 to Fig. 4.

7.2 The outline dimensions and installation dimensions in this manual are the standard dimensions of transformers produced by the company; if those dimensions are changed, please specify any changes when ordering.

## **8 Company Commitment**

Under the condition that users follow the use and storage conditions and the product are well sealed, within 24 months from the production date, our company will provide repair and replacement service free of charge for any damage or abnormal operation due to poor manufacture quality. A paid repair will be provided if the warranty period expires. For any damage due to one of the following situations, a paid repair will be given even if within the warranty period:

- (1) Improper operation, maintenance, or storage;
- (2) Modified without permission or improper repair;
- (3) Damage due to falling off or caused during installation after purchase;
- (4) Force majeure such as earthquakes, fires, lightning strikes, abnormal voltages, and secondary disasters;

If you have any question, please contact the dealer or our company's customer service department.



# Certificate

DELIXI ELECTRIC LTD

Name: Control Transformer

Model: BK Series

This product passes the inspection and is allowed to be shipped

Standard: Q/DLX 361

Inspector: Check 05

Production date: See product or package