

BZL-10C 轴电流继电保护装置

调试运行指南



哈尔滨华新电力电子设备有限公司

BZL-10C 操作及使用

1、前面板



前面板

1. **设置状态显示:** 显示当前设置状态，无显示为正常监测状态
2. **当前数据显示:** 实时显示轴电流值
3. **报警状态显示:** 1#报警灯亮表示轴电流值超过 1#报警设定值；2#报警灯亮表示轴电流值超过 2#报警设定值
4. **当前监测频率显示:** 两个指示灯循环显示，50Hz 指示灯亮，表示仪表正在监测主轴基波电流；150Hz 指示灯亮，表示仪表正在监测主轴三次谐波电流
5. Δ : 每按一下，设定值加 1
6. ∇ : 每按一下，设定值减 1
7. **设置/复位键:** 切换设置状态或复位
8. **试验键:** 按下此键进入试验状态
9. **试验状态指示灯:** 进入试验状态此灯亮
10. **试验电流调节旋钮:** 自检状态下调节试验电流

2、后面板



标准型后面板

- 1 RS-232 通信端口（与上位机通信）
- 2 电源开关
- 3 熔断器（保险管容量为 0.5A）。
- 4 接线端子（端子板上排左起 1-10 位，下排左起 11-20 位）：
 - 1, 2 为 150Hz、50Hz 的 4-20mA 模拟量输出正极。
 - 4, 5 为互感器工作绕组输入
 - 6, 7 互感器试验绕组输入。
 - 8, 9, 10 为 1#报警继电器接点输出 1 组常开、1 组常闭
 - 11, 12 为 150Hz、50Hz 的 4-20mA 模拟量输出负极。
 - 13, 14 为 RS-485 通信端口（与上位机通信）
 - 15, 16, 17 为 2#报警继电器接点输出 1 组常开、1 组常闭
 - 18 为接地
 - 19, 20 为工作电源（交流供电时接 L, N; 直流供电时正接+, 负接-）



定制型后面板

1 电源开关

2 熔断器（保险管容量为 0.5A）。

3 接线端子（端子板上排左起 1-10 位，下排左起 11-20 位）：

1, 2 为 RS-485 通信端口 T/R+, T/R-（与上位机通信）

3, 4 和 5, 6 为 1#报警继电器接点输出两组常开

7, 8 和 9, 10 为 2#报警继电器接点输出两组常开

11, 12 为 50Hz 的 4-20mA 模拟量输出

13, 14 为互感器工作绕组输入

15, 16 为互感器试验绕组输入

18 为接地

19, 20 为工作电源（交流供电时接 L, N; 直流供电时正接+, 负接-）

3、设置

3.1 1#报警设置（见图 1）:



图 1

3.1.1 按下**设置**键，数码管第一位显示 1

3.1.2 按△或▽设定 1#报警值，例如 0.60 为 0.6A（出厂设置为 0.5A）

3.1.3 按设置键复位（直至第 1 位数码管无显示），进入正常监测状态

3.2 2#报警设置（见图 2）:



图 2

3.2.1 按下**设置**键，数码管第一位显示 2

3.2.2 按△或▽设定2#报警值,例如1.15为1.15A(出厂设置为1.5A)

3.2.3 按**设置**键复位(直至第1位数码管无显示),进入正常监测状态

3.3 延时设置(见图3)



图 3

3.3.1 按下**设置**键,数码管第一位显示 3

3.3.2 按△或▽设定延时(接点动作),例如015为15秒(出厂设置为30秒,建议其设置不应低于10秒)

3.3.3 按**设置**键复位(直至第1位数码管无显示),进入正常监测状态

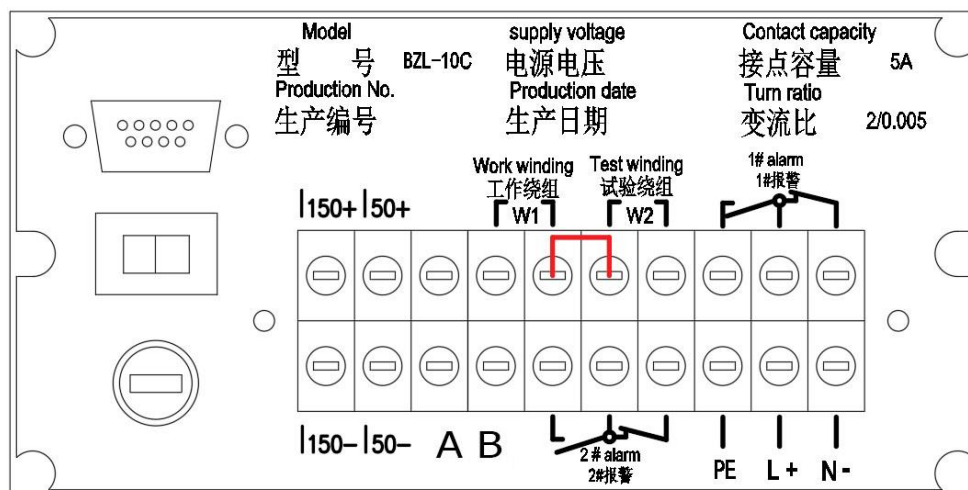
注:设置键按一次第一位显示“1”,再按显示“2”,第三次按显示“3”,第四次按复位。

4、自检

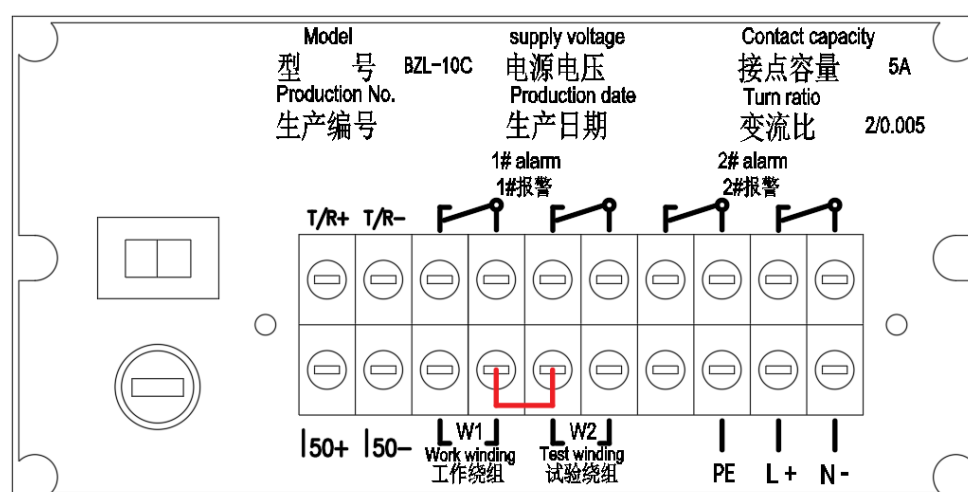
注意:自检功能用于验证设定值准确性,执行此功能时无延时及触点输出。

4.1 装置自检:

4.1.1 继电器接线(见图4)



标准型继电器自检接线示意图



定制型继电器自检接线示意图

4.1.2 按下**试验**按钮, **试验**指示灯亮。(见图 5)



图 5

4.1.3 调节**试验电流调节**旋钮至 1#报警设定值，1#报警信号灯亮。

(见图 6)



图 6

4.1.4 继续调节**试验电流调节**旋钮至 2#报警设定值，倒计时后，2#报警信号灯亮。(见图 7)



图 7

4.1.5 自检完毕后将电位器退回原位。

注：此功能正常，亦可证实本设备无故障。

5、上位机在线监测

5.1 485 通讯接口

按照下图把继电器输出端子与上位机通过转换器用屏蔽导线正确连接，即可实现继电器与上位机的通信。

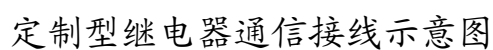
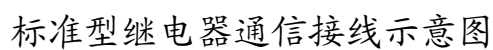


图 8

5.2 驱动程序的安装见（图 9）

将 U 盘与计算机相连，运行相对应的文件即可。点击“运行”。

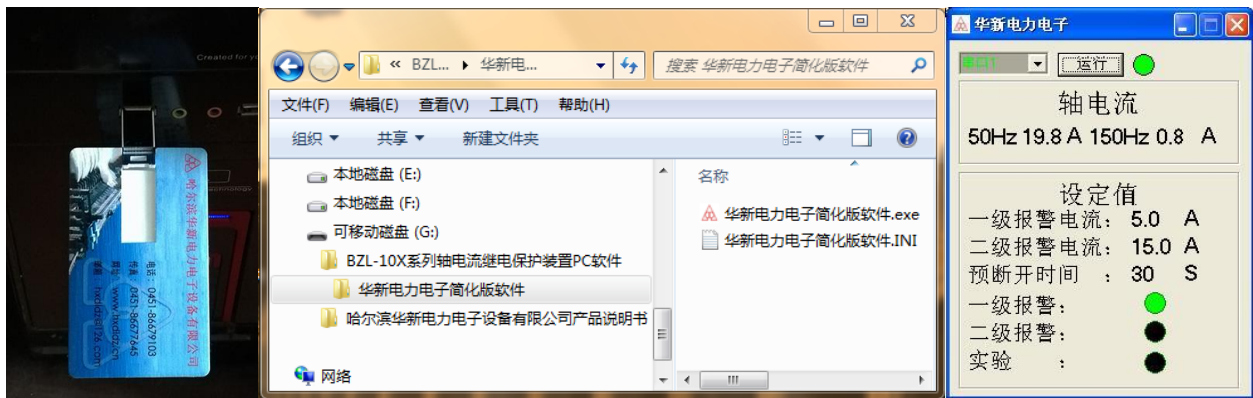


图 9

注：建议通讯距离不大于 1000 米。

6、互感器的安装与接线

6.1 卸下互感器连接板，将互感器两半分开后套在发电机轴的安装位置上（连接板与互感器上的标识 1 对 1、2 对 2、3 对 3、4 对 4，切勿上错）。

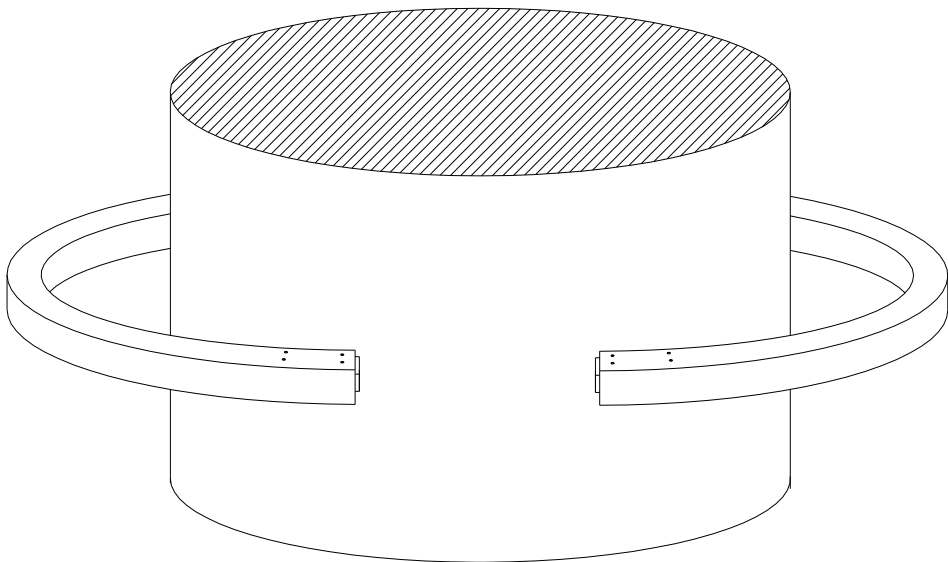


图 6.1

6.2 按照互感器上的标识找出对应的连接板，用螺栓可靠预装在一起。

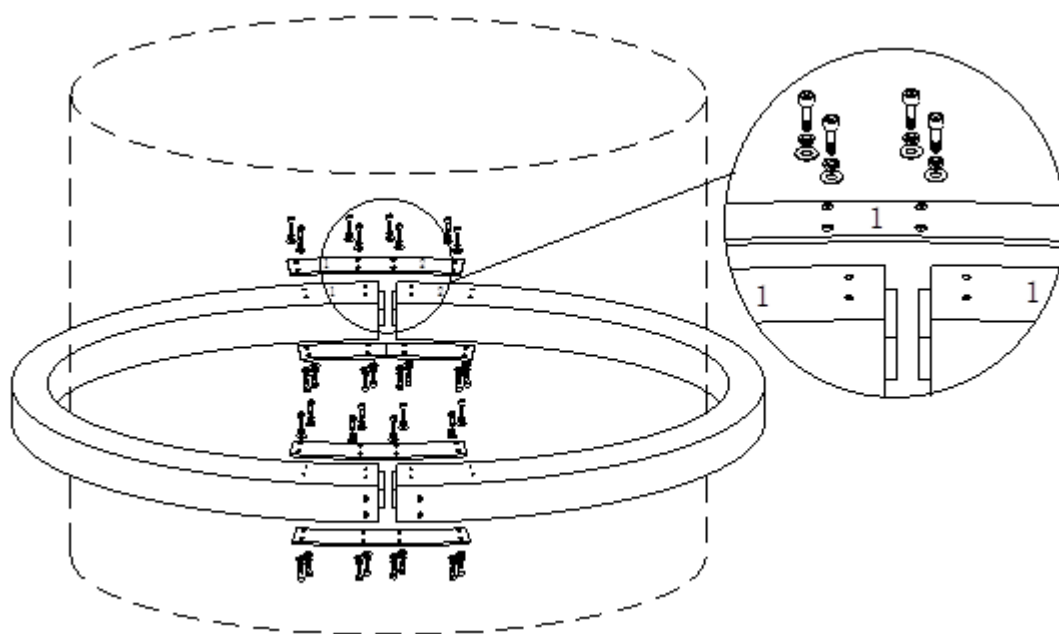


图 6.2

6.3 按照箭头方向推挤，同时将连接板螺栓旋紧并保证各螺栓紧固力矩相同，互感器切口处间隙小于 0.2mm。

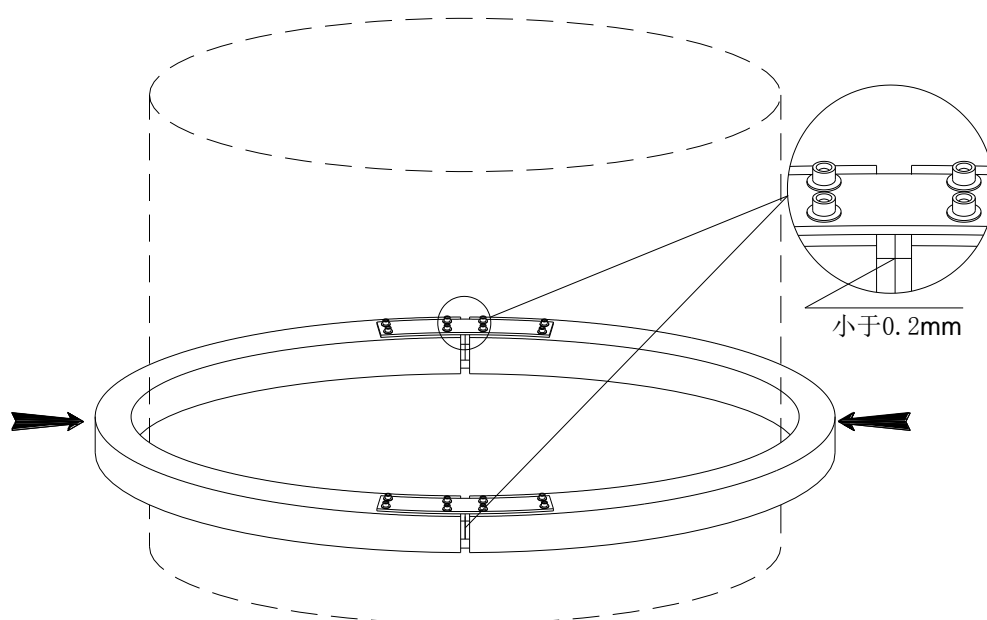


图 6.3

6.4、把安装支架等分装在互感器的外侧，并把支架配套的与主体焊接用的过渡连接板与支架安装在一起。

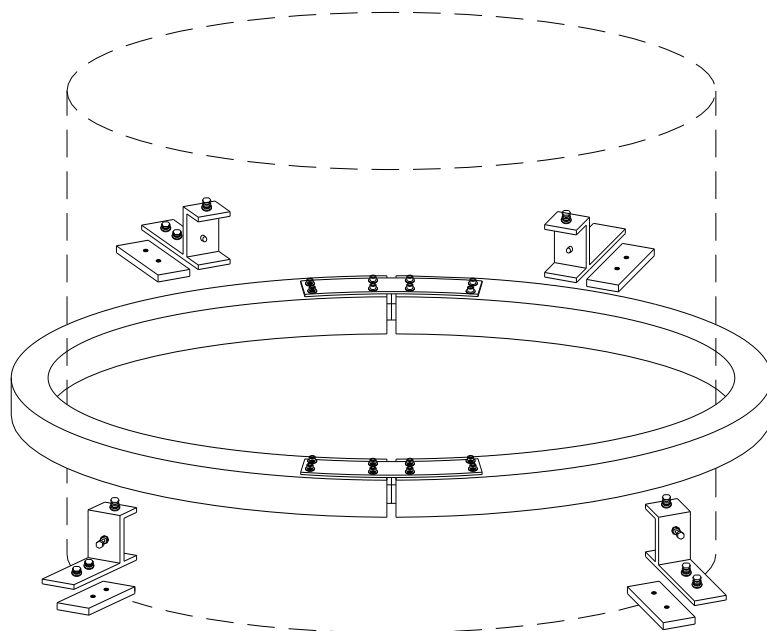


图 6.4

6.5、与主体的焊接:

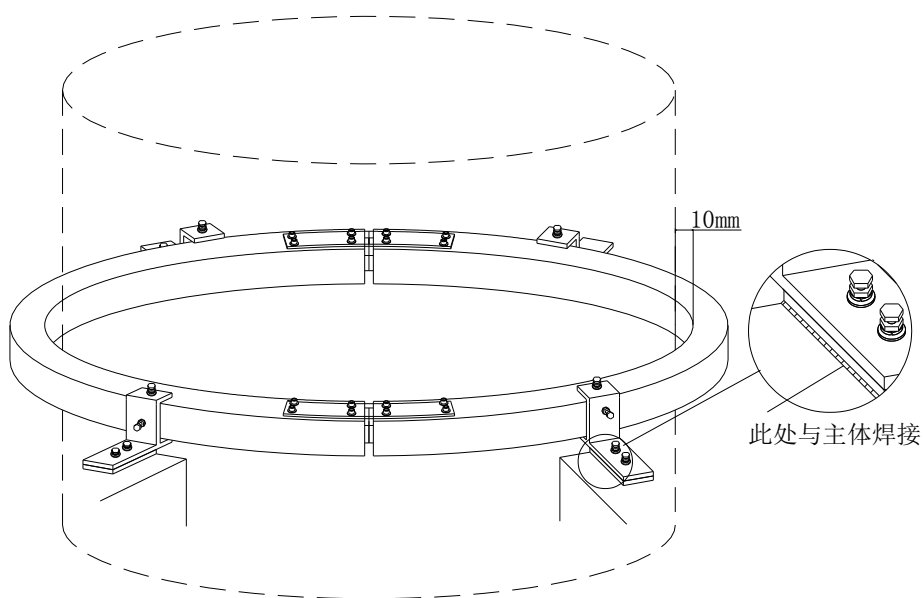


图 6.5

6.5.1 调节并保证互感器与机轴的水平度与同心度: 水平度误差为 2mm, 互感器与机轴的同心度误差为 $10 \pm 1\text{mm}$ 。

6.5.2 把支架配套的过渡连接板与主体焊接在一起, 对互感器要充分遮挡, 避免焊接时灼伤、损坏。

6.5.3 再次调节互感器与机轴的水平度与同心度及切口间隙并满足公差要求。
 如有必要可在支架与互感器间加适当厚度的垫片以满足水平度公差要求，垫片面积应略大于互感器与支架的接触面积。

6.6 接线:

6.6.1 正面：将互感器左右两半水平方向靠上的两个端子和靠下的两个端子分别用屏蔽电缆引出至继电器后面板的工作绕组（W1）和试验绕组（W2）。

注：工作绕组（W1）和试验绕组(W2)可互换。

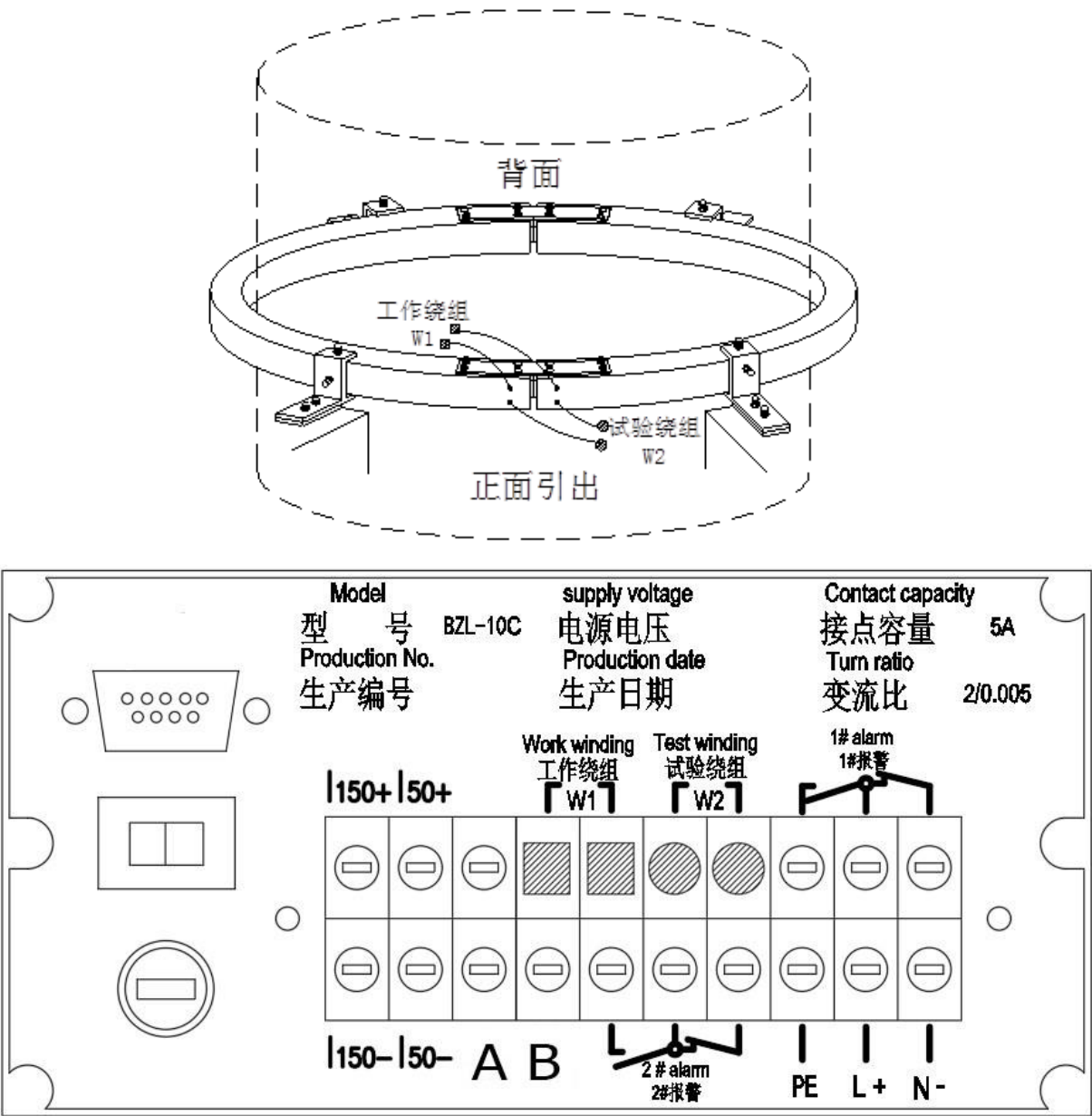


图 6.6.1

6.6.2 背面：将互感器左右两半水平方向靠上的两个端子和靠下的两个端子分别用短接线短接（短接线为随机配置）。

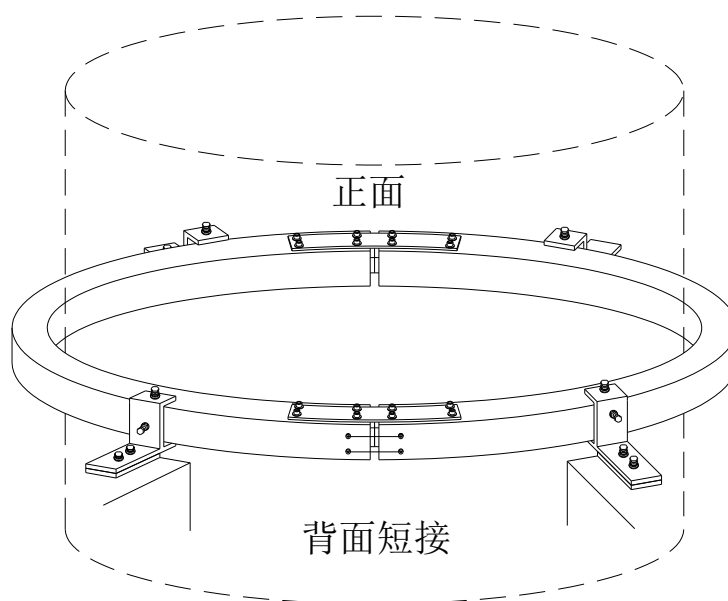


图 6.6.2

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BZL-10C Shaft Current Relay Protection

Equipment

Guide of Debug and operation



Harbin Huaxin Power Electronic Equipment Co., Ltd.

The operation of BZL-10C

1 Front Panel Components



1. **State of setup** : Displays current state of setup. Blank stands for normal monitoring state
2. **Current date display** : Real time display of axial current value
3. **Alarm state display** : The 1# alarm light indicates that the axial current value exceeds the 1# alarm setting value; the 2# alarm light indicates that the axial current value exceeds the 2# alarm setting value
4. **Current monitor frequency display** : The two indicator cycles are displayed, and the 50Hz indicator light indicates that the instrument is monitoring the fundamental current of the spindle. The 150Hz indicator light indicates that the instrument is monitoring the three harmonic current of the main shaft
5. Δ : increase the value of setup
6. ∇ : decrease the value of setup
- 7 **Setup/Restart key**: Switch the state of setup or restart
8. **Test key**: Press this button to enter the test status

9. **Test Light:** Enter the test status, this light is on

10. **Electricity Current Adjustment Knob:** Adjust test current under self checking condition

Back Panel Components



Standard type rear panel

1. RS-232 communication interface (PC communication port)

2. power switch

3. fuse (safety tube capacity 0.5A)

4. terminal

1, 2 for 150Hz, 50Hz 4-20mA analog output positive pole

4, 5 for the transformer work winding input

6, 7 for the transformer test winding input

8, 9, 10 for the 1# alarm relay contact, output 1 groups of normally open, 1 sets of normally closed

11, 12 for 150Hz, 50Hz 4-20mA analog output negative

13, 14 for RS-485 communication interface (PC communication port)

15, 16, 17 for the 2# alarm relay contact, output 1 groups of

normally open, 1 sets of normally closed

18 for grounding

19, 20 for the power supply (AC power supply when the L, N; DC power supply is connected +, negative -)



Custom rear panel

1. power switch

2. fuse (capacity 0.5A)

3. terminal

1,2 is the RS-485 communication interface, T/R+ and T/R- (upper computer communication port)

3,4 and 5, 6 for 1# alarm, two normally open contact outputs

7,8 and 9, 10 for 2# alarm, two normally open contact outputs

11, 12 for the 4-20mA analog output of the 50Hz

13, 14 for the transformer work winding input

15, 16 for the transformer test winding input

18 for grounding

19, 20 for the power supply (AC power supply when the L, N; DC power supply is connected +, negative -)

3 SET

3.1 1# setting of the alarm (see Figure 1):

3.1.1 Press the Setup button, the first LED display "1".



Figure 1

3.1.1 Press the Setup button, the first LED display "1"

3.1.2 Press \triangle or ∇ to set "1 #" alarm value, such as 0.60 to 0.6A (factory setting is 0.5A)

3.1.3 Press the setting key until the first bit digital tube is not displayed and enter the normal monitoring state

3.2 2# setting of the alarm (see Figure 2):



Figure 2

3.2.1 Press the Setup button, the first LED display "2."

3.2.2 Press Δ or ∇ 2 # alarm setting value, for example 1.15 to 1.15A (factory setting is 1.5A)

3.2.3 Press the setting key until the first bit digital tube is not displayed and enter the normal monitoring state

3.3 Delay setting (see Figure 3):



Figure 3

3.3.1 Press the Setup button, the first LED displays "3."

3.3.2 According to a set time delay (or at the contact action, for example) 015 to 15 seconds (the factory is set to 30 seconds,

the set should not be less than 10 seconds) 3.3.3 Press the Setup button reset (until the first one LED does not display), the device enters the normal monitoring state.

3.3.3 press the setting key until the first bit digital tube is not displayed and enters the normal monitoring state

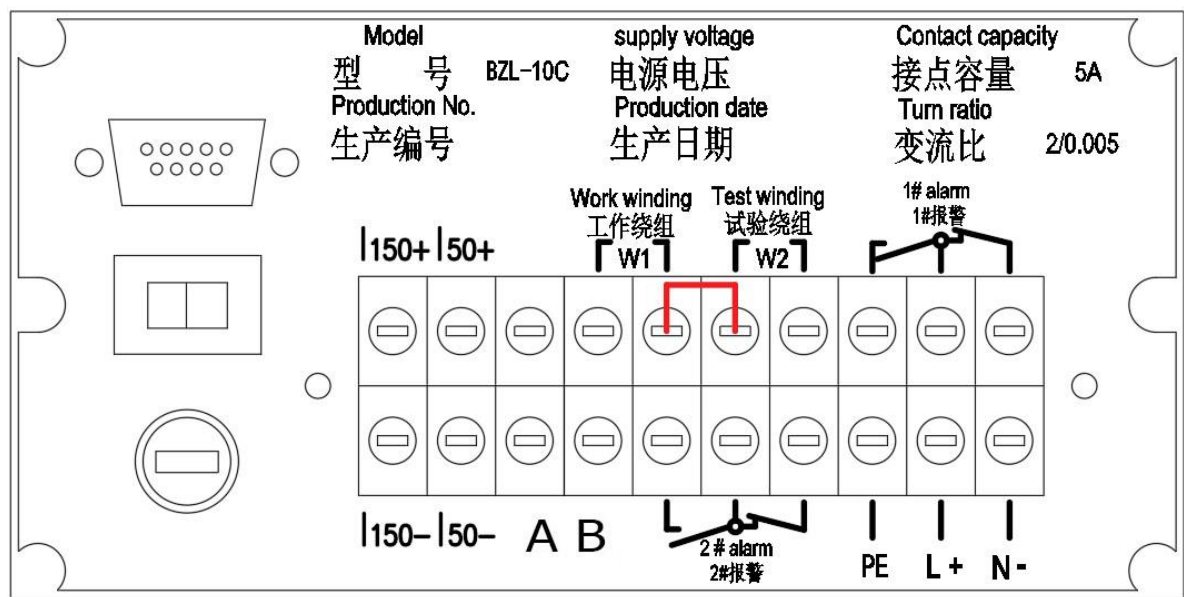
Note: The first time you press the Set button LED display a "1", the second press shows "2", the third press shows "3", the fourth press reset.

4 Device detection

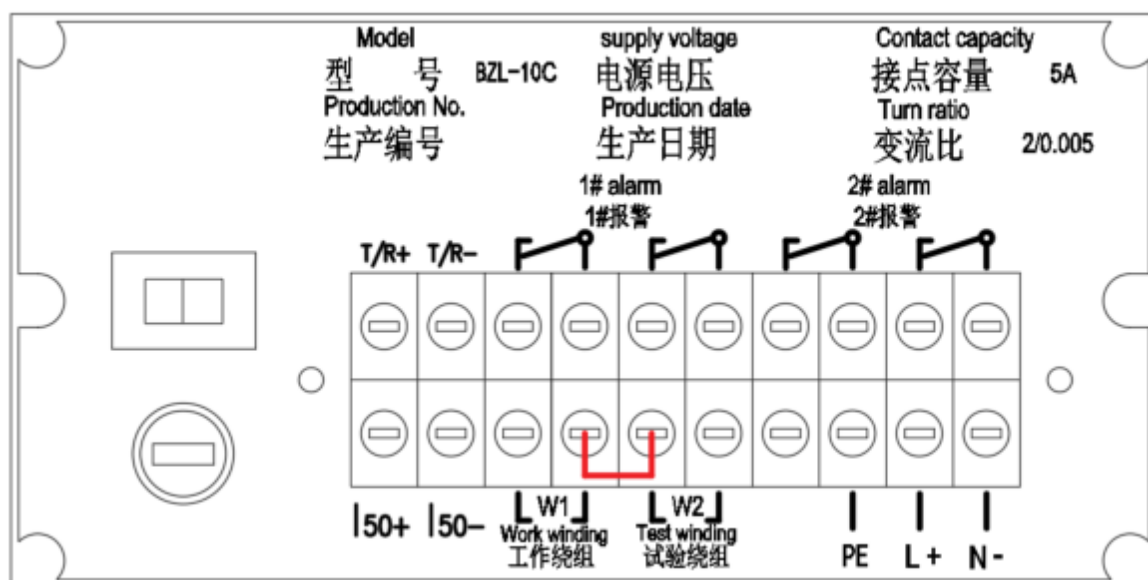
!! Note: this feature is used to verify the accuracy of the setting value, the state without delay and contact output.

4.1 Device self-test:

4.1.1 Relay wiring (see Figure 4):



Standard relay self wiring diagram



Custom relay self wiring diagram

Figure 4

The adjacent terminals of W1 and W2 are shorted by wire according To the diagram.

4.1.2 Press the test button to test indicator light. (See Figure 5)



Figure 5

4.1.3 Adjustment knob to adjust the test current alarm setpoint 1#, 1# warning light illuminated. (See Figure 6)



Figure 6

4.1.4 Continue to adjust the test current adjustment knob to two alarm settings 2#, 2 # warning lights Bright and start delay. (See Figure 7)



Figure 7

4.1.5 check is completed, the potentiometer is returned to its original position.

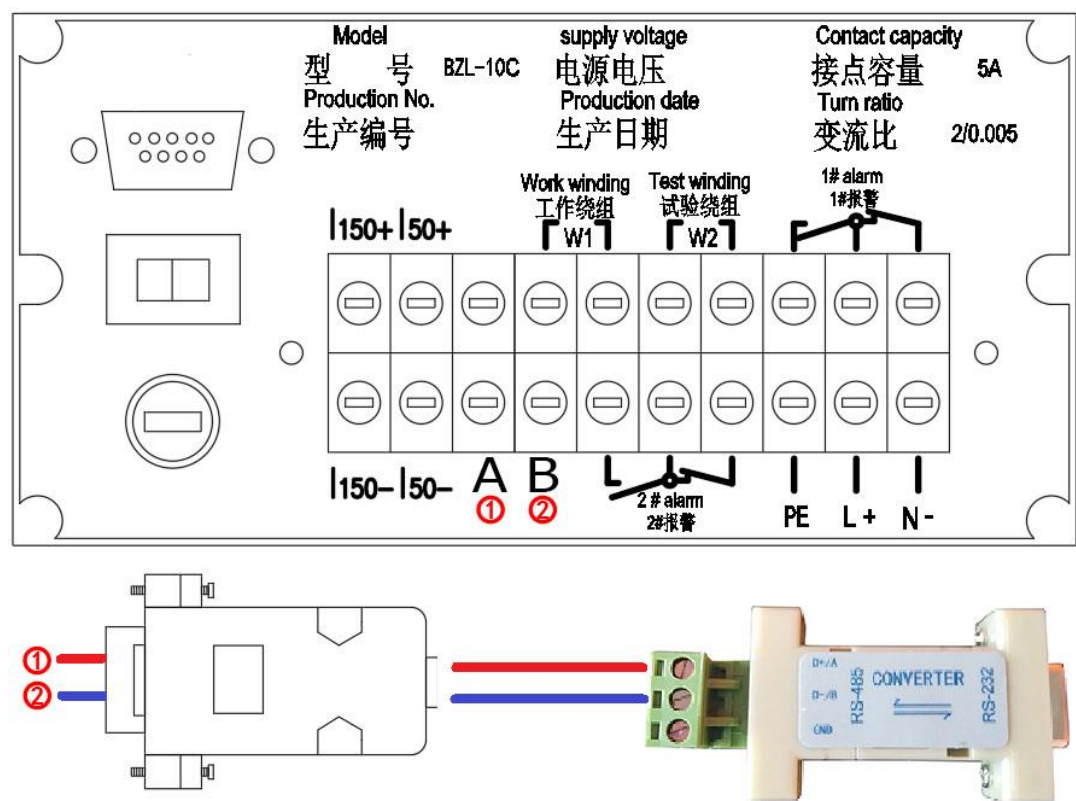
Note: this function is normal, and it can also be proved that the equipment is free from malfunction.

5 5 PC monitor

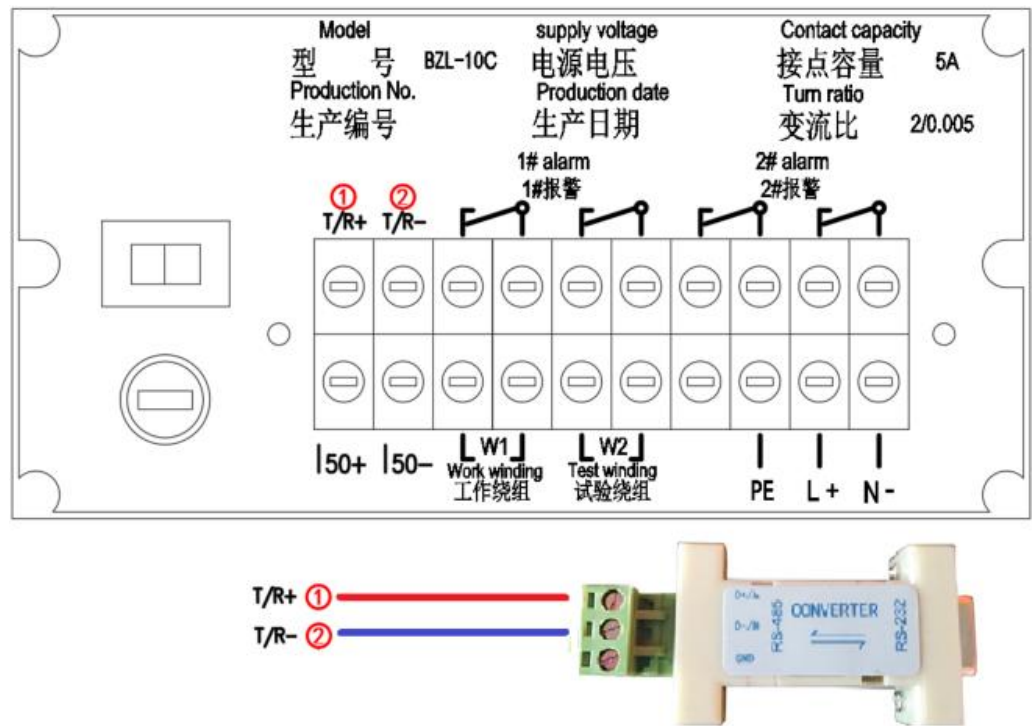
5.1 485 communication interface

In accordance with the following diagram, the relay output terminal and the host computer are connected properly by a shielding wire through a converter, and the communication between the relay and the host

computer can be realized.



Schematic diagram of connection of standard type relay rear panel



Schematic diagram of the wiring of the rear panel of the customized relay

Figure8

5.2 Driver installation (see Figure 9)

Insert the U disk into the computer and install as indicated. The computer that runs after the instrument and communication cable are properly.

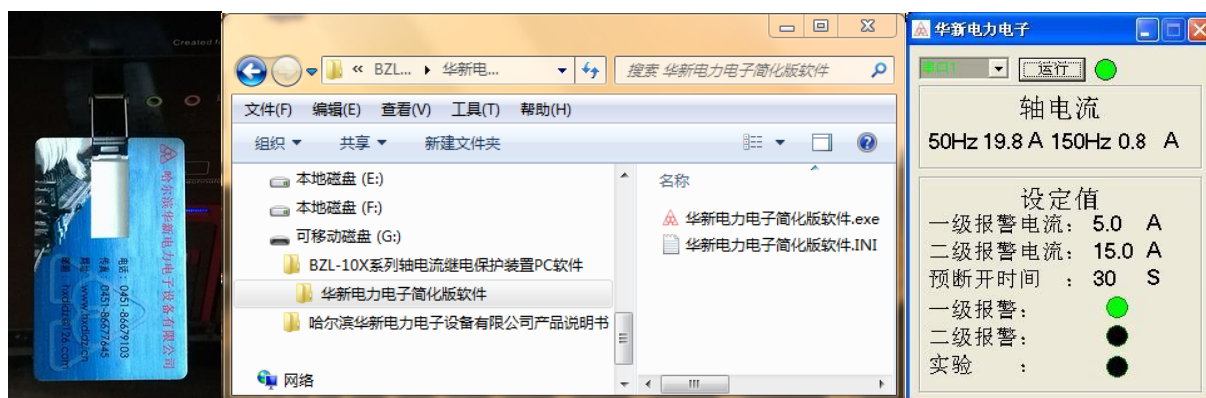


Figure 9

Note: The recommended cable length is not greater than 1000 m.

6、Transformer installation and wiring

6.1 Remove the transformer connection plate, the transformer in two separate after the installation position of the generator shaft (in accordance with the instrument on the identification of 2 pairs of 1, 3 to 4, not on the anti).

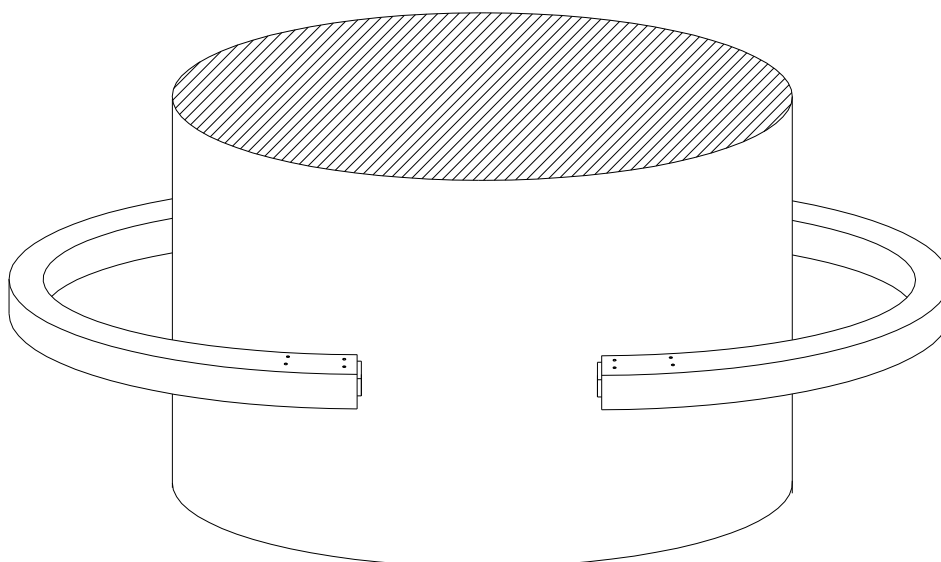


Figure 6.1

6.2 According to the identity of the transformer to identify the corresponding connecting plate, with a bolt reliable pre installed together.

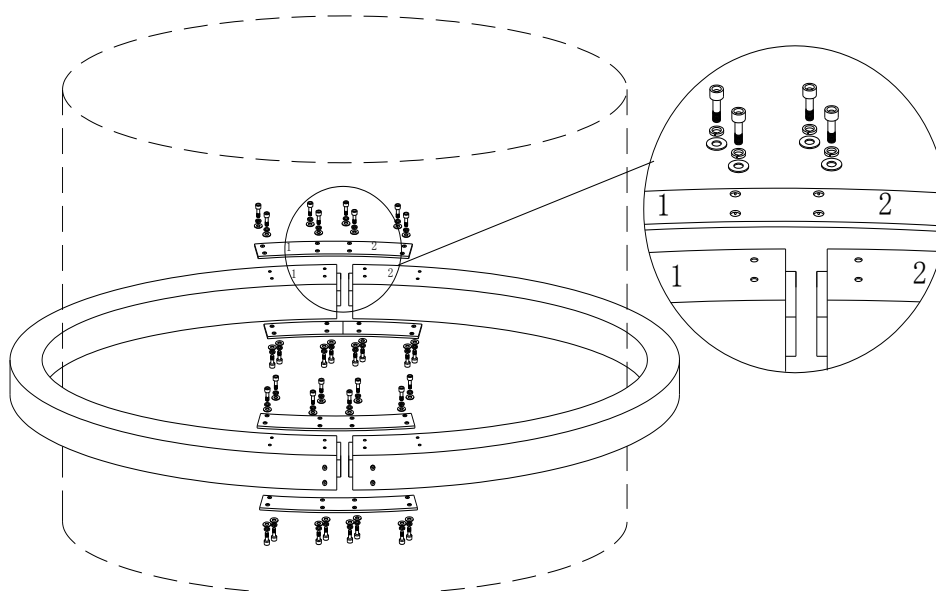


Figure 6.2

6.3 In the direction of the arrow push, as well as the connection plate bolts are screwed tightly and ensure that the bolts tightening torque of the same, the transformer incision gap less than 0.2 mm.

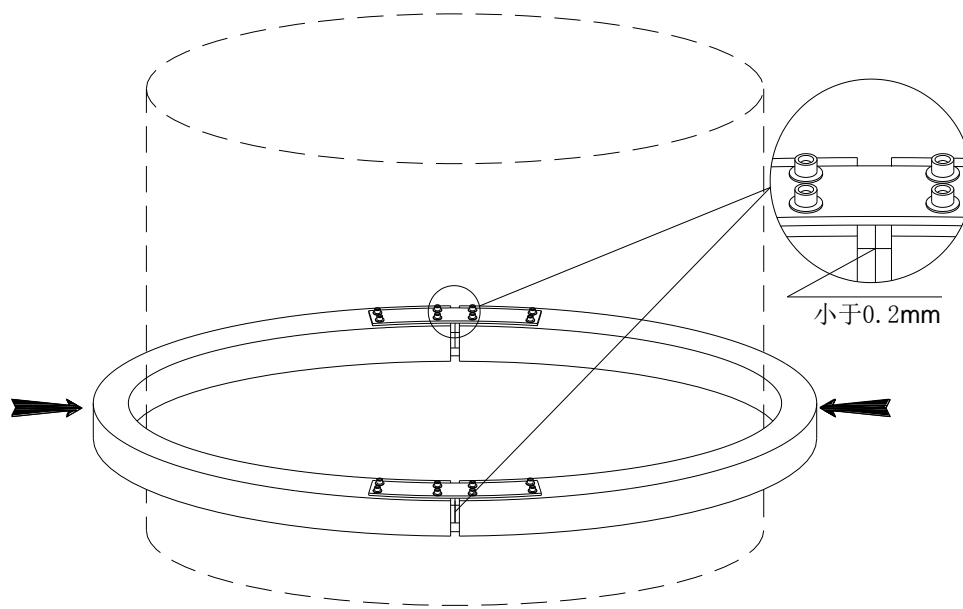


Figure6.3

6.4 the installation bracket is installed in the outer side of the transformer, and the supporting frame and the main body of the welding with the transition connecting plate and bracket installed.

6.5 with the main body of the welding:

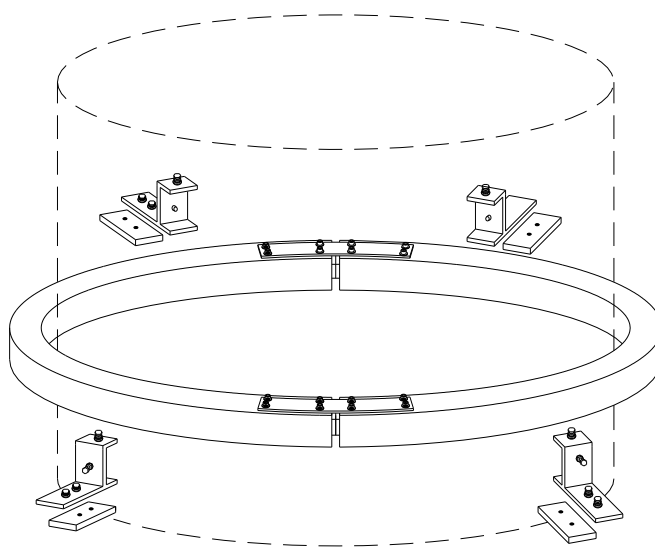


Figure6.4

6.5 Welding with main body:

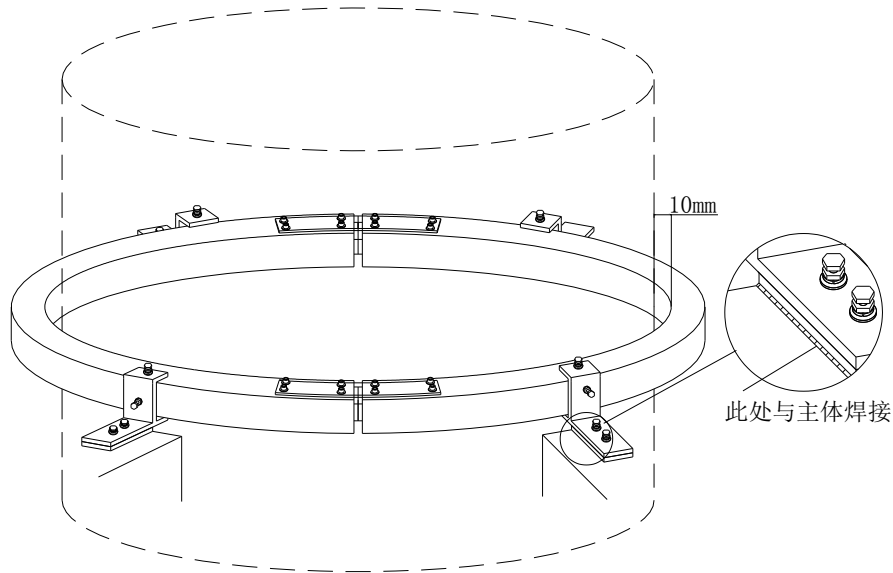


Figure 6.5

6.5.1 regulation and ensure the transformer and the crankshaft of the level of degree and concentricity: horizontal error is 2mm, transformer and shaft concentricity error for $10 + 1\text{mm}$.

6.5.2 supporting the supporting of the supporting plate and the main body welded together, the transformer should be fully shielded to avoid welding burns, damage.

6.5.3 Once again adjust transformer and shaft level and concentricity and the gap and meet the tolerance requirements. In order to meet the requirement of horizontal tolerance, the gasket area should be slightly greater than the contact area of the mutual inductor and the support, if necessary, the gasket can be added to the bracket and the mutual inductance between the two transformers.

6.6 wiring:

6.6.1 positive: about transformer in two horizontal directions on the two

terminals and by two terminals respectively with shielded cable leads to relay panel working winding (W1) and test winding (W2).

Note: the working winding (W1) and (W2) interchangeable winding test.

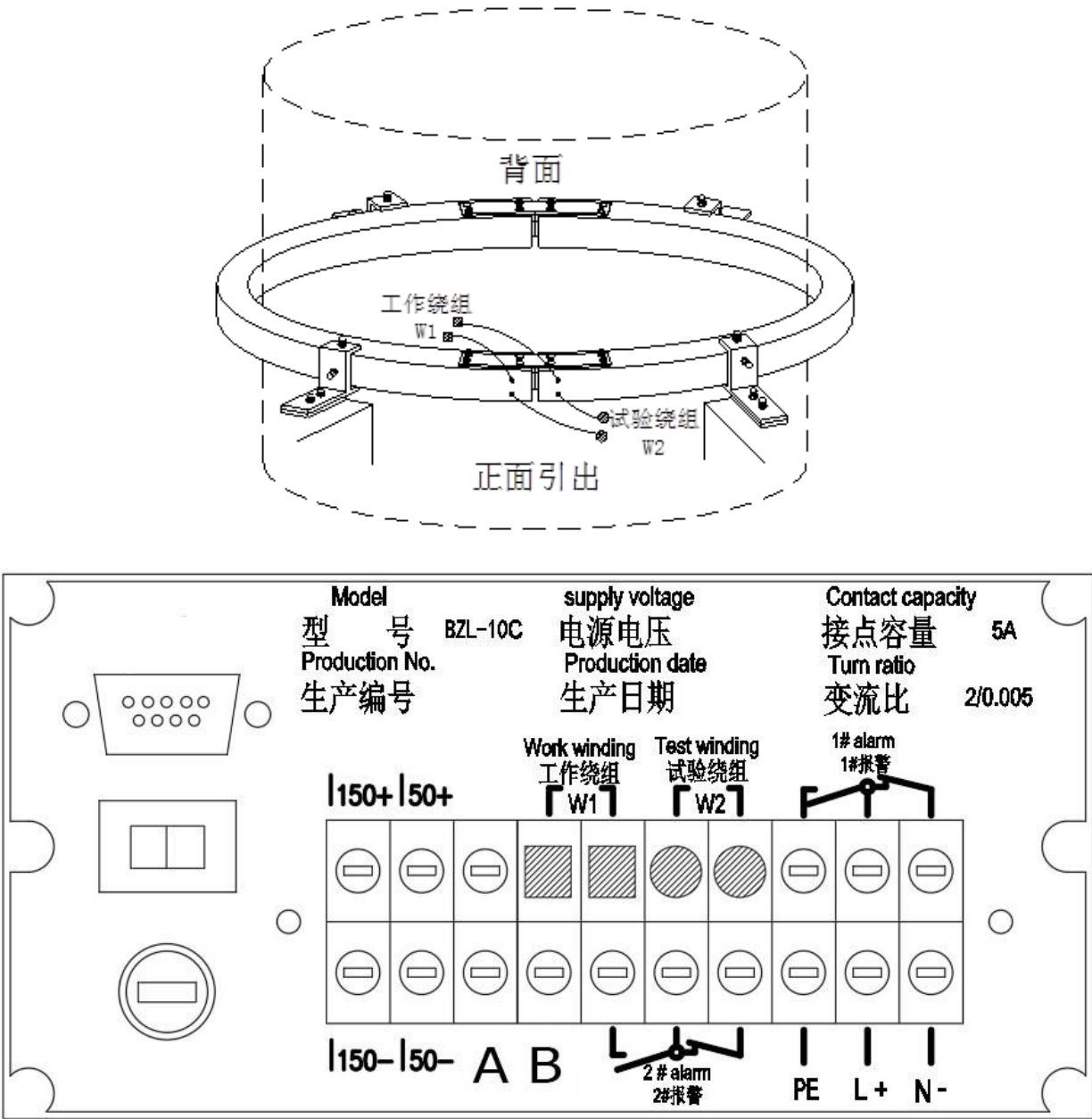


Figure 6.6.1

6.6.2 back: the two terminal and the two terminal on the two halves of the transformer are respectively connected with the shortterminal(short connection to the random configuration).

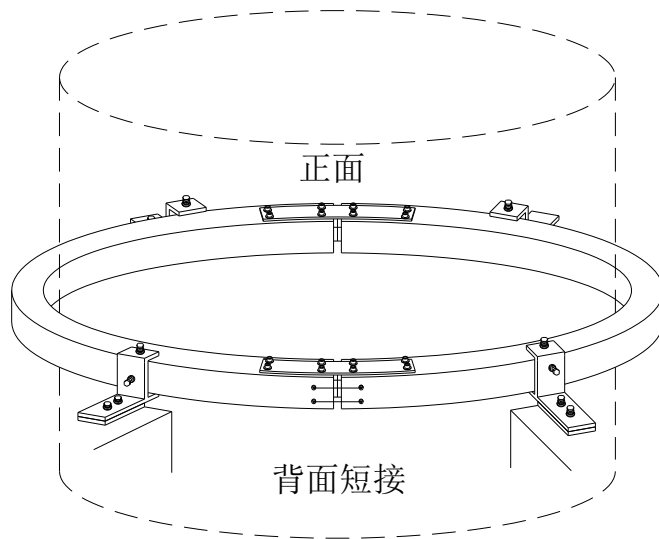


Figure 6.6.2

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