用户手册
USER MANUAL

JDCF 运输、安装、维护使用说明书
JDCF Transportation, Installation and Maintenance Manual

M020003497

Sieyuan® 思源电气

CN/目录

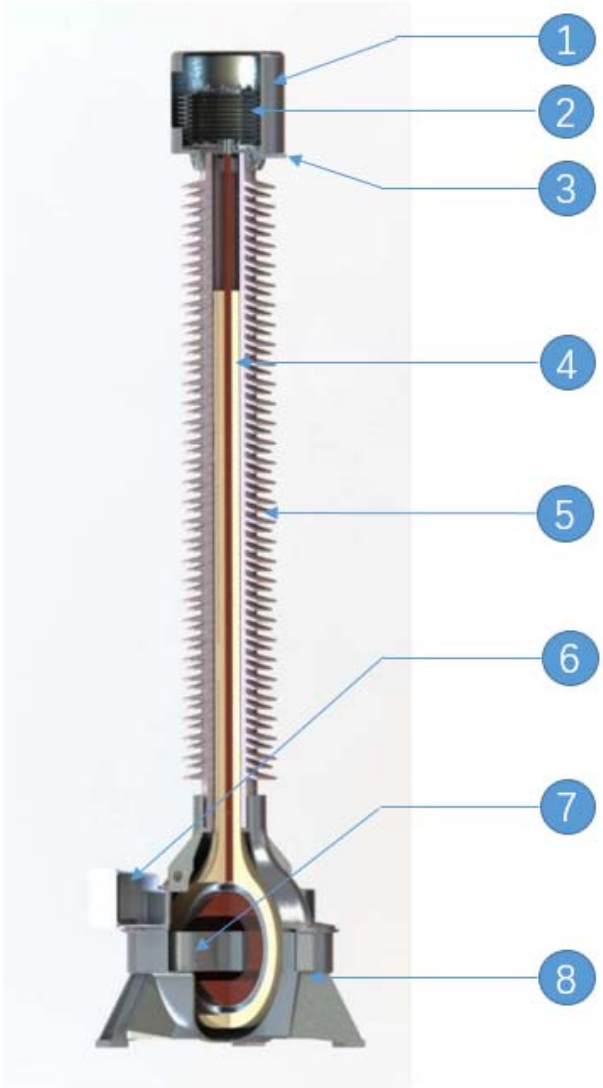
EN/ Contents

适用范围/Application Scope

CN/本使用说明书适用于户外型、电磁式电压互感器产品的运输、安装、维护及注意事项等要求。供额定频率为 50Hz 或 60 Hz 的中性点有效接地系统中作电压、电能测量及继电保护用。

EN/The Manual is applicable to transportation, installation, maintenance and other precautions of outdoor type and electromagnetic voltage transformer.They are used for voltage, electric energy measurement and relay protection in neutral point effective grounding systems at rated frequency of 50Hz or 60 Hz.

产品说明/Product description



1.CN/膨胀器外罩
EN/Expander housing
2.CN/膨胀器
EN/Expander
3.CN/一次接线端子
EN/Primary terminal
4.CN/电容屏套管
EN/Capacitance screen bushing
5.CN/套管
EN/drivepipe
6.CN/二次出线盒
EN/Secondary outlet box
7.CN/铁心
EN/Iron core
8.CN/油箱
EN/Fuel tank

工作条件/Operation Conditions

CN/环境条件

最高气温：40 ℃

日平均气温不超过：35 ℃

最低温度：-40 ℃

月平均最大相对湿度：95 %（25℃）

以上温度为常规使用温度等级，当该说明书上的使用温度与技术规范不一致时，以签订的技术规范为准。

EN/ Environmental Conditions

Maximum temperature : 40 ℃

Daily average temperature no more than: 35℃

Minimum Temperature : -40 ℃

Monthly average maximum relative humidity: 95% (25℃)

The above temperatures are normal service temperature grades, when the service temperature on the Manual is inconsistent with the technical specification, the signed technical specification shall prevail.

CN/海拔高度

互感器实际应用海拔详见产互感器上的铭牌。

安装处海拔超过 1000m 时，其外绝缘的绝缘水平按 IEC 60071 进行修正。

未经我公司允许，不得将互感器挪用到其他高海拔地区（超过互感器铭牌上的海拔）。

EN/ Altitude

The actual application altitude of the transformer is shown in the nameplate on the transformer.

When the altitude of the installation location exceeds 1000m, the insulation level of the external insulation shall be modified according to IEC 60071.

Without the permission of our company, it is not allowed to divert the transformer to other high-altitude areas (higher than the altitude on the nameplate of the transformer).

运输/Transportation

CN /产品运输须将产品固定在包装箱内（72.5-145kV 产品为直立运输，145 产品为水平运输）；

长距离运输时，建议使用互感器的原有包装箱，并按原有形式重新装箱；

近距离流转时，采用铲运或吊运方式，吊运时使用柔性软吊具，单根吊带长度不小于 4.5m，且使用的吊绳承受重量应大于包装箱（含互感器）重量 2 倍以上。铲运时，按照包装箱上的标识运输、铲运流转。

EN/Products shall be fixed in the packing box for transportation (72.5-145KV products shall be transported vertically, 145 products shall be transported horizontally)；

For long-distance transportation, it is recommended to use the original packing case of the transformer and repack it in the original form；

In the case of short distance transfer, shovel or lift shall be adopted. When lifting, flexible and soft lifting tools shall be used. The length of a single lifting belt shall not be less than 4.5m, and the supporting weight of the lifting rope shall be more than 2 times of the weight of the packing case (including the transformer). When shoveling, transport and transfer according to the mark on the packing box.

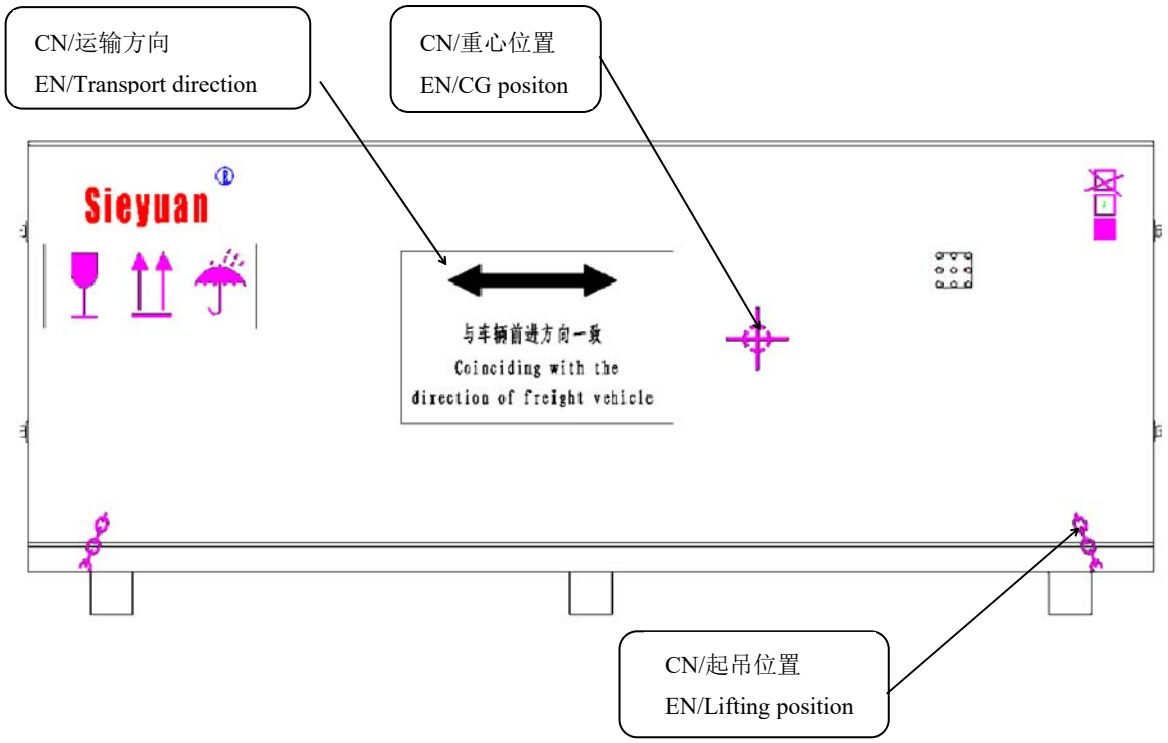


图 4.1 运输标识（Shipping mark）

存储/Storage

CN/互感器按原有包装形式，储存在干燥通风，无腐蚀的环境中，一年期内存放的需在包装箱外加盖防雨材料做好防潮措施，一年期外存放的加盖防雨棚，不允许露天存放；

互感器堆放不允许超过包装箱表面堆层标识要。

EN/The transformer shall be packed in the original form and stored in a dry, ventilated and non-corrosive environment. It is not allowed to be stored in the open air and moisture-proof measures shall be adopted. The stacking of transformers shall not exceed the stacking marking requirements on the surface of packing box.

Do not stack transformers in excess of the marked stacking layer on the surface of the packing

签收及拆箱检查/Receiving and Unpacking Inspection

CN/（1）互感器签收前，核实产品及配件数量是否与订货一致；

（2）检查包装箱外观是否有损坏、油渍等异常；

（3）互感器开箱后，检查互感器外观有无磕碰、损坏或漏油等异常，资料是否齐全

EN/（1）Before receiving the transformer, check whether the quantity of products and accessories is consistent with the order;

（2）Check the appearance of the packing box to ensure there is no damage, oil stains and other abnormalities.

（3）Before unpacking and lifting the transformer, check whether the transformer is bumped, damaged or leaking oil.

吊装/Lifting

CN/JDCF 72.5-145 互感器起吊时，用绳子固定在瓷套与膨胀器下法兰之间，保证产品在起吊时不会倾倒，如图 7.1 所示。

EN/When the JDCF 72.5-145 transformer is lifted, a rope should be fixed between the porcelain sleeve and the lower flange of the expanator to ensure that the product will not fall over during lifting, as shown in Fig.7.1

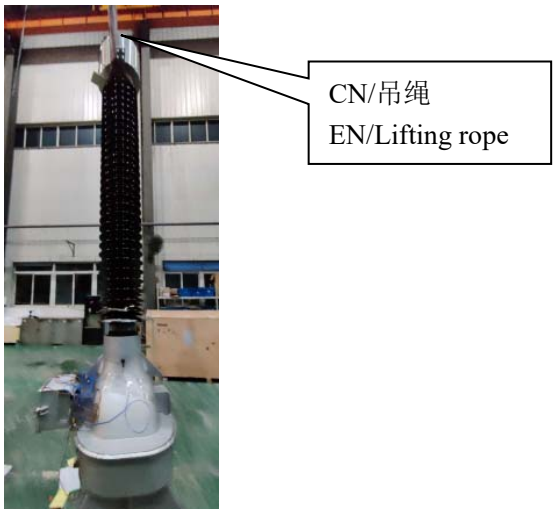
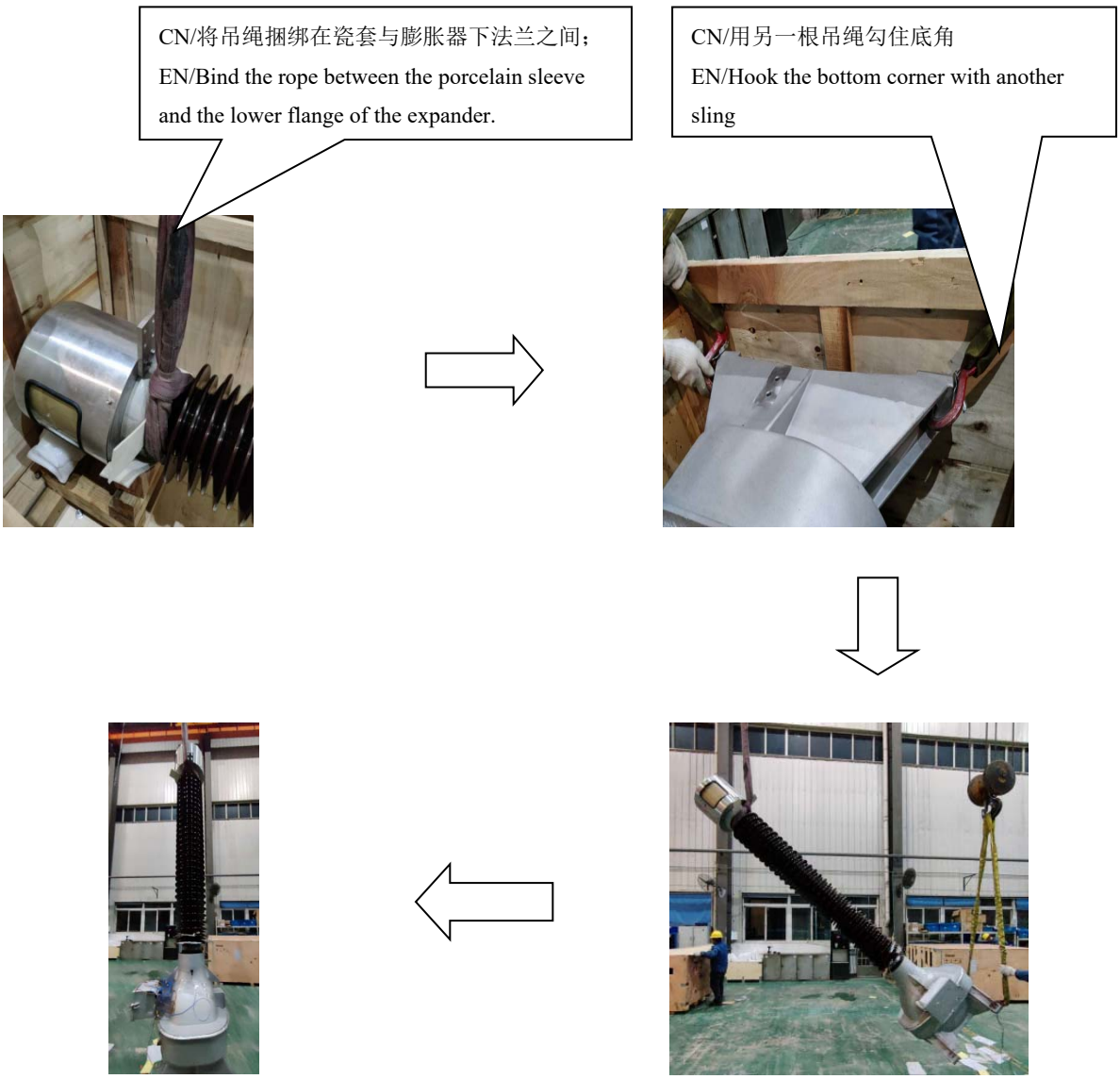


图 7.1　JDCF 72.5-145 起吊示意图

Figure 7.1 Lifting diagram of JDCF 72.5-145

CN/JDCF-245 起吊：
EN/Lifting JDCF - 245：



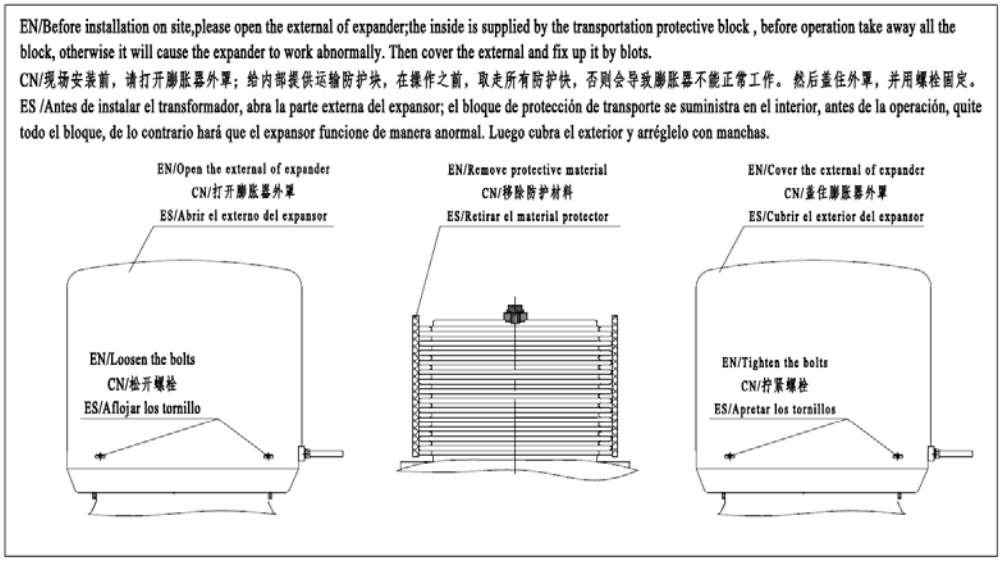
EN/缓慢起吊，注意不要碰伤套管，至一定高度后底脚处缓慢下降，直至产品竖立；
CN/Slowly lift, be careful not to touch the casing, after reaching a certain height, slowly descend at the bottom foot, until the product stands up;

CN/注意：绳子的长度，保持互感器重心平衡；
EN/Note: the length of the rope should keep the center of gravity of the transformer balanced.

安装/Installation

CN/互感器安装前，应拆除膨胀器外罩内侧的防护纸版和运输防护垫块；（见产品膨胀器外罩上图或如图 8.1 所示）

EN/ Before installing the transformer, the protective paper plate and transportation protective cushion block on the inner side of the outer cover of the expander shall be removed (as shown in Fig. 8.1);



CN/图 8.1 拆装说明
EN/Fig. 8.1Disassembly instructions

CN/互感器安装固定

采用合适长度的吊具，将互感器吊到平面安装支架上，互感器就位后，用螺栓与安装支架固定牢靠，产品安装固定后，才可拆除吊具。

EN/Transformer Installation and Fixation

Use a lifting tool of appropriate length to lift the transformer to the plane bracket. After the transformer is in place, fasten it firmly with the mounting bracket with bolts. Connect the base of the transformer to the bracket at equal potential with the grounding bar. After the product is installed and fixed, the lifting tool can be removed.

CN /一次接线端子

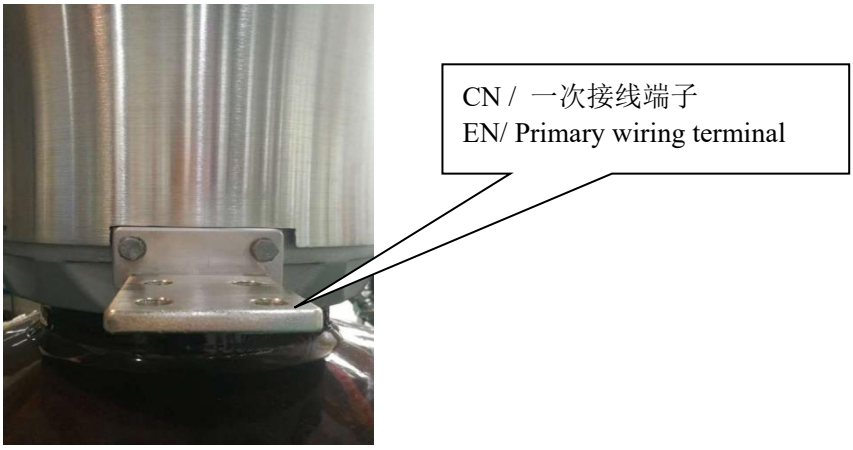
一次端子连接前，先确认一次端子进线方向，可对接触面进行清理，保证接触面无锈蚀氧化现象；接触面可涂适量导电膏。连接紧固件力矩 60N·m,保证接触面无缝隙。

注：一次接线端子可根据现场进线方向进行左右（P1、P2）互换。

EN/ Primary wiring terminal

Confirm theterminal entry direction and clean the contact surface before the connection of the primary wiring terminal, confirm theprimary wiring terminaldirection first ,so as to ensure that there is no rust and oxidation on the contact surface; the contact surface can be coated with an appropriate amount of conductive paste. Connect the fasteners to ensure the long-term effective contact pressure.

Note: The primary terminals can be interchanged left and right according to the incoming line direction.



CN/二次端子连接

在连接二次端子前，应确保系统处于未通电状态，并同时注意由附近运行的设备所引起的游离电磁场。

(1) 按照互感器铭牌或说明牌的示意图、现场安装图进行二次端子的连接，检查是否松动，二次端子如图 8.2。

(2) 二次绕组不允许短路，正常运行时，tanδ与 N 短接，N 接地。

(3) 实际供货产品二次端子数量可能与本说明书不同，以实物为准。

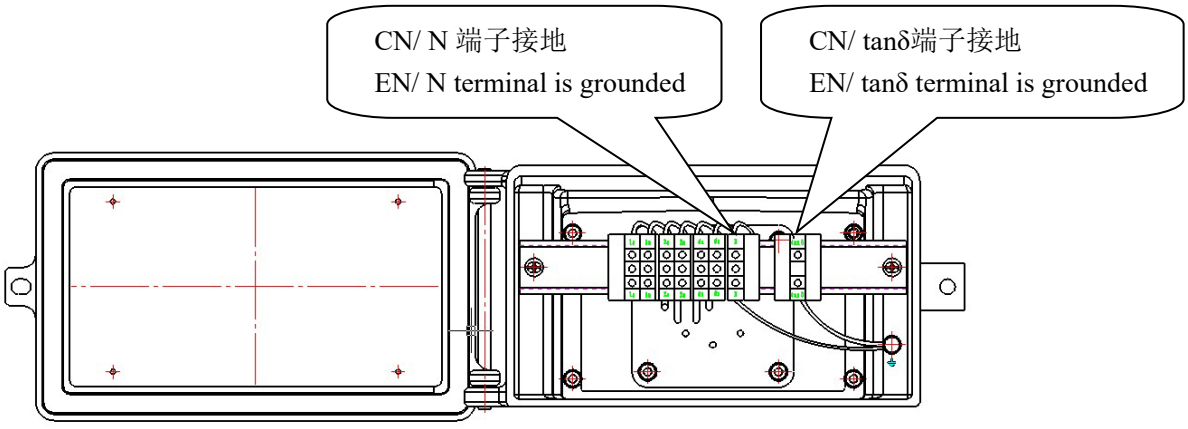
EN/ Secondary Terminal Connection

Make sure that the system is not energized, and pay attention to the free electromagnetic field caused by the nearby equipment before connecting the secondary terminal.

(1) Connect the secondary terminal according to the schematic diagram of the transformer nameplate or instruction plate, and check whether it is loose. The secondary terminal is shown in the Fig. 8.3.

(2 No short circuit is allowed in the secondary winding. During normal operation, tanδ is connected with N in short circuit way and N is grounded.

(3) The secondary terminal of the real product may be different from the manual, and the real object shall prevail.



CN/图 8.2 二次端子示意图
EN/Fig. 8.2 Schematic Diagram of Secondary Terminal

CN/接地端子连接

互感器的接地端子位于互感器油箱下方，该接地点应与电站地网可靠连接。接地线应能承受系统短路电流。

EN/ Grounding Terminal Connection

The grounding terminal of the transformer is located under the base of the transformer. The grounding point should be reliably connected to the ground grid of the power station. The grounding wire shall be able to withstand the system short-circuit current.

投运及维护/Operation and Maintenance

CN/投运前检查

(1) 互感器安装固定后，至少静置 24h 后再投运；

(2) 确认三相互感器油位高度一致（见下表中 2 图）；

(3) 检查互感器外观完好、无漏油异常；

(4) 确认二次绕组接线正确，无短路现象；

(5) tanδ及 N 端子连接接地可靠。

EN/ Inspection before Operation

(1)After the transformer is installed and fixed, it should be kept stand still for at least 24h before being put into operation;

(2)Confirm the oil level of the three-phase transformer is consistent;

(3)Check the appearance of the transformer is in good condition and there is no abnormal oil leakage;

(4)Make sure the connection of the secondary winding and the terminal N is reliable,no short circuit.

(5)The N and tanδshould be firmly grounded.

CN/日常巡查项目

设备投运后，应经常性进行日常检查，检查内容如表 10.1。

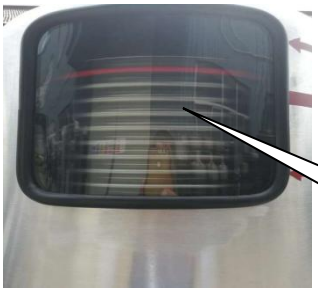
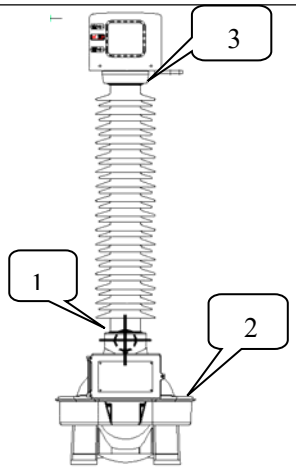
EN/ Routine Inspection Items

After the equipment is put into operation, routine inspection should be carried out regularly according to Table 10.1

CN/表 10.1 检查项目

EN/Table 10.1 Inspection Items

CN/ 序号 EN/ No.	**CN/ 检查项目 EN/ Check items**		**CN/ 合格要求 EN/ Requirements**	**CN/ 巡查时间 EN/ Inspection time**
1	**CN/** 运行状态 **EN/** Operating condition	**CN/** 仪表指示 **EN/** Instrument indication	**CN/** 仪表指示正常 **EN/** Instrument indicates normally	**CN/** 投运运行期间 **EN/** During the operating period

2	**CN/** 油位指示器 **EN/** Oil level indicator	**CN/** 1、检查三相互感器膨胀器油位指针高度是否一致； 2、油位指示红色标识线位置。 **EN/** 1.Check whether the oil level indicator height of three-phase transformer expander is consistent; 2. Check the red marker line of the oil level indicator. 	**CN/** 1、三相互感器的红色油位指示高度基本一致； 2、油位红色标识线在MAX与MIN之间，并且清晰可见。 **EN/** 1.The indicated height of the red oil level of the three-phase transformer shall be basically consistent; 2. The red mark line of the oil level shall be between MAX and MIN, and be clearly visible. 油位线 The oil level	**CN/** 投运运行期间 **EN/**Duringthe operating period
3	**CN/** 连接部位/油阀口 **EN/** Connecting position/oil valve inlet		**CN/** 三个位置无油迹 **EN/** There are no oil stains on the three position	**CN/** 运行期间 **EN/** During the operation
4	**CN/** 一次接线端子 **EN/** Primary wiring terminal	**CN/** 一次接线端子连接有无扭曲变形，连接处有无变色。 **EN/** Connection of primary airing terminal has no distortion, and the color of connection position shall not be changed.	**CN/** 一次接线端子连接无扭曲变形，一次连接处颜色没有变黑。 **EN/** Connection of primary airing terminal has no distortion, and the color of connection position shall not be black.	CN/ 验收时 投运前 运行中 **EN/** During acceptance Before operation During operation

5	**CN/** 瓷套 **EN/** Insulator	**CN/** 瓷套伞裙有无破损、裂纹、严重油污、放电痕迹及其它异常情况。 **EN/** Check where there are damage, cracks, serious oil stains, electric discharging trace and other abnormal conditions for the insulator skirt.	**CN/** 瓷套伞裙无破损、裂纹，无严重油污，无放电痕迹及其它异常情况。 **EN/** There is no damage, cracks, serious oil stains, electric discharging trace or other abnormal conditions for the insulator skirt.	**CN/** 运行期间 **EN/** During the operation
6	**CN/** 声音 **EN/** Sound	**CN/** 运行有无异响。 **EN/** Cheak whether there is abnormal sound in operation.	**CN/** 无异响。 **EN/** There is no abnormal sound.	**CN/** 运行期间 **EN/** During the operation

回收处置/Recovery and Disposal

CN/此产品主要组成材料成分包含：金属铜、铁、铝，变压器油及陶瓷；在正常工况条件下，互感器使用寿命为 30 年。互感器到期报废或不再使用后，金属铜、铁、铝，变压器油及陶瓷应集中交给具有资质的单位回收处理，以避免对环境的污染影响。

EN/ The main components of the product include copper, iron, aluminum, transformer oil and ceramics. Under normal working conditions, the service life of the transformer is 30 years. When the transformer is scrapped or no longer in use, the copper, iron, aluminum, transformer oil and ceramics shall be collectively handed over to the qualified unit for recycling and processing, so as to avoid the pollution and impact on the environment.

附录 A/Appendix A

CN/介损因数 tan δ 测量说明

EN/Description of Dielectric Dissipation Factor measurement

CN/将互感器一次 A 端子和二次绕组端子从电网上断开，二次端子盒内标记 tanδ的端子要从接地端子(⏚)断开。测量电压施加在互感器顶部的高压 A 端，tanδ端子接测试仪 Cx，外接标准电容器（如果有）接测试仪 Cn。一次绕组末端 N 端子、所有二次绕组的末端及底座必须要接地。测量电压为 10kV，介损测量值应小于 0.5%。

EN/Disconnect the primary A terminal and the secondary winding terminal of the transformer from the power grid. The terminal marked with tanδ in the secondary terminal box should be disconnected from the ground terminal (⏚). The measurement voltage is applied to the high-voltage terminal A on the top of the transformer, the tanδ terminal is connected to the tester Cx, and the external standard capacitor (if any) is connected to the tester Cn. The N terminal at the end of the primary winding, the ends of all secondary windings and the base must be grounded. The measuring voltage is 10kV, and the measured value of dielectric loss should be less than 0.5%.

警告：试验时，所有二次绕组只能末端接地，首末端不得短接。

Warning: During the test, all secondary windings can only be grounded at the end, and the head and end shall not be short circuited.

试验后，产品在与线路连接前，请确认已将二次端子盒内的端子 N 和 tanδ端子可靠接地。

After the test, please confirm that the N terminal and tanδ terminal in the secondary terminal box are reliably grounded before connecting the product to the line.

CN/绝缘电阻测量

EN/insulation resistance measurement

a）CN/一次绕组 N 端对二次绕组及地绝缘电阻测量

a）EN/Measurement of insulation resistance between the N terminal of the primary winding and the secondary winding and the ground

CN/将互感器一次端子和二次端子从电网上断开，拆开一次绕组 N 端接地线。一次绕组 A-N 短接后接绝缘电阻测试仪的加压端子，所有二次绕组短接后与外壳连接并接地，绝缘电阻表接地端子与产品外壳连接接地。施加电压 2500V（DC），绝缘电阻应大于 1000MΩ。

EN/Disconnect the primary and secondary terminals of the transformer from the power grid, and disconnect the N-end grounding wire of the primary winding. After the primary winding A-N is short-circuited, connect the pressurizing terminal of the insulation resistance tester. After all the secondary windings are short-circuited, connect to the shell and ground, and the ground terminal of the insulation resistance meter is connected to the product shell. The applied voltage is 2500V (DC), and the insulation resistance should be greater than 1000MΩ.

b）CN/二次绕组对一次 N 端及地绝缘电阻测量

b）EN/Measurement of insulation resistance of secondary winding to primary N terminal and ground

CN/将互感器一次端子和二次端子从电网上断开，一次绕组 A-N 短接后接地、非被试二次绕组短接接地、外壳接地。被试二次绕组短接后接绝缘电阻测试仪的加压端子，绝缘电阻表接地端子与产品外壳连接接地。施加电压 2500V（DC），绝缘电阻应大于 1000MΩ。依次对每个二次绕组进行绝缘电阻测量。

EN/The primary and secondary terminals of the transformer are disconnected from the power grid, the primary winding A-N is short-circuited and then grounded, the non-tested secondary winding is short-circuited to ground, and the shell is grounded. After the tested secondary winding is short-circuited, connect the pressure terminal of the insulation resistance tester, and the ground terminal of the insulation resistance meter is connected to the product shell to ground. The applied voltage is 2500V (DC), and the insulation resistance should be greater than 1000MΩ. The insulation resistance of each secondary winding is measured in turn.

CN/直流电阻测量

EN/DC resistance measurement

CN/用电阻测试仪测量一次绕组和各二次绕组的直流电阻，同型号、同规格、同批次互感器的相同绕组直流电阻和平均值的差异不大于 10%，换算至同一温度的电阻值与出厂试验无显著差异（由于使用仪器不同和测量方法不同，现场测量值和出厂值存在差异）。

EN/Use a resistance tester to measure the DC resistance of the primary winding and each secondary winding. The difference between the DC resistance of the same winding and the average value of the same model, the same specification, and the same batch of transformers is not more than 10%, and the resistance value converted to the same temperature is There is no significant difference in the factory test (due to different instruments and different measurement methods, there is a difference between the on-site measured value and the factory value).