



高电科技
HIGH VOLTAGE TECHNOLOGY

www.hzhv.com



HIGH VOLTAGE TECHNOLOGY

CT3335

绝缘油含气量测定仪

使用说明书

杭州高电科技有限公司

HANGZHOU HIGH VOLTAGE TECHNOLOGY CO.,LTD

电话：0571-89935600 传真：0571-89935600

目 录

1.概述.....	2
I. Outline.....	2
2.主要技术指标.....	3
II. Mainly Technical Index.....	3
3.主要组成部分及功能.....	4
III. Mainly Consisted Part & Functions.....	4
4.仪器的安装与注意事项.....	4
IV. Instruments Installation & Attention Matters.....	5
5.仪器的简单操作.....	6
V. Instruments Simply Operation.....	7
6.仪器简单故障的检测与维修.....	8
VI. Instrument Simple Detection and Repair for Faults.....	8
7.仪器附件清单.....	10
VII. Instrument Accessories List.....	10
8.本仪器所需配套设备.....	10
VIII. Instrument Required Equipment & Accessories.....	10

1.概述

为了更好更全面地预防变压器发生故障,电力行业对各等级变压器的安全运行提出了更高的要求,其中对变压器的含气量的测试要求也相应提高了。

本仪器总结实际使用中遇到的一些问题,采用了比较合适的新的传感器技术开发而成的新一代测定仪,其实用性更强,性能更加稳定可靠,操作十分方便,比较适合超高压充油设备中含气量的测定,是您实验室较为理想的试验设备,它将使您的工作倍感轻松!

I. Outline

In order to fully and better to prevent the faults of transformer, the power industry established a higher standard for each grade of the transformer's safety operation. In it, the testing standard of gas content in the transformer are also correspondingly been raised.

This Type Insulating Oil Gas Content Automatic Tester, summarized happened some questions in actually using process, is adopted a more suitable new sensor technology to developed a new generation of testing instrument. It is a more practical, more stable's instrument and performance reliable, operation very easy. More suitable for ultrahigh pressure oil-filled of equipment gas content measurement. It is an ideal test equipment in your laboratory, and it will make your job more easily!

其主要特点如下:

- 1、全金属结构,避免了以前玻璃器皿式测试仪的易碎,密封性不好等问题。
- 2、应用高精密度高稳定性的进口差压传感器,使测试数据更精确,重复性更好。
- 3、测试电路包含有测量大气压和环境温度的传感器。无论您在何时何地,都可以自动测量您所处地环境温度和大气压,自动换算成标准大气压下 0 度时的含气量,并直接在液晶屏上显示,使您的工作更加轻松。
- 4、独特的注气体反标测试程序,可以让您方便地检测仪器标定或测量是否正确。
- 5、油样测试时间短,全部测试时间只需要七分钟。
- 6、仪器在测试的过程中,真空泵的运行由仪器根据状态自行控制,大大降低了噪音,延长了真空泵的使用寿命。
- 7、仪器可以自动储存最后所做的二十条测试数据,并同时储存测试时间,温度,大气压等,以便您方便地查取数据。

Mainly Features as following:

- 1.All-metal structure, to avoid the questions of glassware tester, fragile and in bad sealing function, etc.
- 2.Use imported differential pressure sensor which with high accuracy and high stability, to guarantee the tested value in more accuracy and better repeatability.
- 3.The testing circuit include the sensors that measuring atmospheric pressure and ambient temperature. Whatever you are in where and when, the instrument can be automatically measured your lived place's ambient temperature and atmospheric pressure. Automatically to convert the gas content into the standard atmospheric pressure at 0 degree, and directly show it on the LCD display, make your job easier.
- 4.Unique anti-scale gas injection test program that let you easily to check the instrument calibration or measurement is correct or not.
- 5.The test time for the oil samples is short, all the testing time takes only seven minutes.
- 6.The instrument in the process of testing, the vacuum pump running is controlled by instrument according to their own status, like this, its greatly reducing the noise and prolong the using life of the vacuum pump.
- 7.Instrument can be done a automatically stores the last twenty pieces of test data, and also keep a record to its testing time, temperature, barometric pressure, etc., in order to easily to check fetch data.

2.主要技术指标

检测灵敏度： 即最小检知量为 <0.2%

重 复 性： 同一油样数次平行试验结果，重复性<10%

工作 电源： AC240V±10% 50HZ

体 积： 长 410×宽 325×高 350

重 量： 约 20 kg

II. Mainly Technical Index

Detection Sensitivity: Minimum detectable amount that is <0.2%

Repeatability: The same oil sample in several parallel test results and repeatability <10%

Power supply: AC240V±10% 50Hz

Volume: Length 410X Width 325 X High 350

Weight: Around 20Kgs

3.主要组成部分及功能

- 1、油样定量系统：把一定量（50mL 左右）的油样引入脱气系统进行脱气。
- 2、脱气系统：采用真空型压力喷雾，电动搅拌，脱气效率高。
- 3、数据检测处理系统：运用高精度高稳定性的差压传感器，采集脱出气体后脱罐的内部压力与进油前的压力之间所生的压差信号，经放大，并由数据处理系统进行数据处理，然后将算出的油中的含气量体积百分比直接显示在显示屏上。

III. Mainly Consisted Part & Functions

1. The oil sample quantify system: the amount (about 50mL) of oil sample put into the degassing system for degassing.
2. Degassing system: adopt to vacuum-type pressure spray, electric mixer, high degassing efficiency.
3. Data detection system; to use high precision and high stability of the differential pressure sensor, after the collection of prolapse gas, in the degassing tank, producing a differential pressure signal between degassing tank's inner pressure and before oil entering pressure. Through amplified and data processing system done a data processing, and then calculated the oil's volume percentage of gas content directly showed on the screen.

4.仪器的安装与注意事项

- 1、仪器开箱后，首先应按说明书最后的装箱单进行开箱检查，在判断仪器可能被重摔的情况下，应该打开仪器上盖进行检查，详细检查安装在前面板上的线路板和电线有无压断和脱落现象，整机线缆有无摔断，及后面板上各连接是否正常，在确认完整无损后，才可进行安装，否则应该进行恢复后再安装。
- 2、仪器后面板上有进油接口、真空泵接口、排油接头、真空泵（电源）、电源插座、保险丝座、电源开关等。
 - a、进油接口连接配件中的较短的一段 3mm 聚乙烯管，其另一端连接是接取样针筒的针筒接头；
 - b、真空泵接用配件中较长的一段 3mm 不锈钢管与真空泵相连接；
 - c、排油接口用配件中较短的一般 3mm 不锈钢管接出，另一头用一容器接排出来的废油；
 - d、真空泵（电源）与真空泵上所带的三芯航空插头相接；

- e、 电源插座与配件中的电源插头相连；
- f、 保险丝座中保险丝应在 10A；
- g、 电源开关用以控制仪器的总电源；
- h、 针筒支架用配件中二个 M3 螺丝按编号固定在仪器左面的后上角 M3 螺纹孔中，开孔朝外向上。

3、 请注意仪器每次排油必须排尽，在排油程序中排油管中有气体排出证明油已排尽，如果排油时间过长或过短可以通过重新设置排油时间来达到最佳。

4、 仪器在测试一个油样后，含气量结果会一直保留在显示屏幕上，如果您要做下一个油样，必须按复位键使仪器回到预备状态，显示请启动后再按启动键仪器才会执行下一测试程序。

5、 在预备状态下如果 1 分钟之内没有操作仪器。仪器会自动关闭电磁阀电源进入睡眠状态，可防止电磁阀因长时间通电而带来的损坏。

IV. Instruments Installation & Attention Matters

1. After opened packing box, at first the customer should to check the product according to final packing list in the box, if the instrument has a possible been heavy crash, please open the top cover of instrument to check the status, especially to check the front board, which installed circuit board and wire whether been broken or fall off. Also please check the instrument cable whether been broken, the connecting on the rear board is good or not. After the confirmation to all circuit in good status, then to do next step of installation. Otherwise, the instrument needs to be recover at first.

2. On the instrument rear board into the oil inlet, vacuum pump port, drain oil fittings, vacuum pump (power), power socket, fuse holder, power switch, etc.

a, inlet fitting interface in a short length of 3mm polyethylene tube, which is connected to the other end of the sample needle cylinder connector;

b, a vacuum pump connected to fitting in with a longer length of 3mm stainless steel tube connected to a vacuum pump;

c, drain interfaces accessories generally shorter length of 3mm stainless steel tube connected to the other end with a container then discharged from the waste oil;

d, a vacuum pump (power supply) and vacuum pump brought on three core plug contact;

e, the power outlet is connected to the fitting of the plug;

f, the fuse in the fuse holder should be in 10A;

g, the power switch to control the instrument's total power;

h, the needle cylinder bracket fitting M3 screws fixed on two rear upper corners of M3 threaded holes fixed in the instrument according to number, the open hole is up outwards.

3. Please note that the instrument must be drained out when in every time drain. If in the drain outlet pipe program has proven gas discharge oil has drained. If drain time is too long or too short

can reset drain time to achieve the best results.

4, instrument test after an oil sample containing gas results will remain on the display screen, if you want to do next oil sample, you must press the reset button makes the instrument back to the ready state, the display start again press the start button, the device will be perform the next test program.

5, in the ready state does not operate the instrument if within 1 minute. The instrument automatically closes the solenoid valve power goes to sleep status to prevent the solenoid valve is energized for a long time and caused damage.

5.仪器的简单操作

1、开机

打开仪器电源，仪器的显示屏由上往下分别显示日期、时间；请启动；实时温度、大气压。

2 参数的设定

按设置后出现如下菜单，按↑↓→←键选择您所需实现的功能或要更改的参数。

1)、标定：光标停留在标定菜单上时，按确认键就进入标定程序，仪器会自动定量进油 50ml，并在滤油后提示您用 1ml 针筒分别往脱气罐中注入空气 0.3、0.7、1、1、1、1ml 用来求油中含气量 10%之内的校正曲线，做油样时会根据此曲线来计算油中的含气量。注意仪器出厂前已经详细标定，在使用过程中一般不需要标定，如果确实需要重新标定，您必须要选择密封性很好的针筒，并把针芯一端浸一些变压器油后再插入针管内，以针芯和针管的配合处充满油为最佳，这样油可以更好地帮助针筒起到密封作用，也可以涂些硅脂等帮助密封。

2)、测试：是用来检验仪器标定得是否准确，光标停留在测试菜单上时，按确认键后仪器就进入检验程序，在自动进油和滤油后仪器会提示您注入气体，您可以根据自己需要注入任意量的气体，在注入气体后请按确认键，仪器会在测量结束显示含气量的同时提示您再次注入气体，如此类推可以测量任意次数，在需要退出检验程序时，必须按取消键后程序才会自动退出并进行排油，然后退出该菜单。

3)、数据检索：进入该菜单仪器会显示最后 20 条测试的含气量结果和测试时的环境、温度、大气压。您可以按上下键查找所需要的数据。

4)、系统设置：光标在此菜单时按确认键后，仪器会进入下列子菜单

a、系统时间：设置年月日时间等。

b、含气量时间：设置含气量的测量时间，初始植为 01：00，1 分钟。

c、清洗时间：测试时进适量试油和抽真空对系统进行清洗的时间，初始值为 02：00，2 分

钟。

d、滤油时间：在标定和测试时，油样中的气体全部滤出来时间，初始值为 03：00，3 分钟。

e、排油时间：排废油的时间，初始值为 00：18，18 秒。

f、油样体积：设置实际的进油体积，初始值为 50ml。

g、空气温度标定：调整测试温度与实际温度的误差，只需重新输入正确的实际温度后按确认键即可。

5)、系统检修：是维修人员在维修仪器的程序，是一种可以任意打开电磁阀的程序。

注意：在进入设置菜单后一定要按取消或设置键才能退出设置菜单。

3、做油样

打开仪器的电源开关，用上面五、3、b 中接好的针筒接头把油样接好，尽量保证其密封性良好和针芯活动自如，然后把针筒挂进装在仪器后面板上的针筒支架的大孔内。这时您就可以按启动键做油样了，七分多钟后该油样的含气量结果就会显示在显示屏上。如果要做一个您只需要换好油样按复位键后再按启动键即可。

4、关机

严禁在仪器运行程序时关机，也就是要在仪器测试结束显示含气量或显示启动时关机。

V. Instruments Simply Operation

1. Starting

Open the power supply of the instrument, the instrument displays from top to bottom show the date and time; start; real-time temperature and atmospheric pressure.

2. Parameter setting

After setting the following menu appears, press $\uparrow \downarrow \rightarrow \leftarrow$ keys to select the function you want to achieve or parameter to be changed.

1) Calibration: the cursor in the calibration menu, press the Enter key to enter the calibration procedure, the instrument will automatically quantitatively into oil 50ml, and after oil filter, it will prompt you with 1ml syringe to inject air degassing tank respectively 0.3 0.7,1,1,1,1ml to seek oil containing gas calibration curve within 10%. Depending on the curve to calculate the oil-containing gas to do when the oil sample. Note calibrated instrument factory in detail, in the course generally does not require calibration, if you do need to re-calibrate, you must choose well sealed syringes, and some of the core needle end immersed in transformer oil and then inserted into the syringe, to tie at the core needle and syringe filled with oil is the best, so that the oil can better help play a role in sealing the barrel, put some grease, etc. can also help to seal.

2) Test: is used to test the accuracy of the instrument was calibrated, the cursor is on the test menu, press the enter key, instrument to enter the examination procedure in the oil and oil filter after the automatic instrument will prompt you to inject gas, you can when according to their need to inject

any amount of gas injected into the gas after press the Enter key, the instrument will measure the gas content of the end of the show at the same time you are prompted to re-inject gas, and so on can be measured any number of times, in the need to exit the test program, you must press Cancel button will automatically exit the program and drain, then exit the menu.

3) Data retrieval: Enter the menu will display instrument air content and test results of the last 20 pieces of test environment, temperature, atmospheric pressure. You can press the arrow keys to find the required data.

4) System settings: the cursor is in this menu, press the Enter key, the instrument will enter the following sub-menu:

a, System Time: Set date and time.

b, Gas content Time: Set gas content measurement time, the initial plant is 01: 00,1 min.

c, Cleaning time: into the appropriate amount of test oil and vacuum cleaning system test time, the initial value 02: 2:00 min.

d, Oil filter time: in the calibration and test, the oil sample gas filter out all the time, the initial value 03: 3:00 min.

e, Drain time: time discharge of waste oil, the initial value of 00: 18, 18 seconds.

f, Oil volume: set the actual inlet volume, the initial value of 50ml.

g, The air temperature calibration: adjust the test temperature and the actual temperature error, simply re-enter the correct actual temperature press OK.

5) The system overhaul: the maintenance staff in the maintenance of the instrument program is a solenoid valve can open any program.

Note: Be sure to press the key to cancel or set after entering the setup menu to exit the Settings menu.

3. Oil sample testing

Open the instrument's power switch, with a top-five, 3, b are connected to the oil like a good barrel connector plugged in, try to ensure a good seal and needle core of its freedom of movement, then hanging up the syringe mounted on the rear panel large syringe holder hole. Then you can press the Start button to make the oil sample, the gas content of the oil samples after seven minutes the result will appear on the display.If you simply want to change to do better the next oil sample press the reset button and then press the start button.

4. Power off

When the instrument is running prohibited programs shut down, that is the same to appear in the instrument end of the test the gas content or display starts off.

6.仪器简单故障的检测与维修

VI. Instrument Simple Detection and Repair for Faults

序 号 Item No.	故 障 Faults	维 修 说 明 Repairing Instruction
-----------------	---------------	----------------------------------

1	真空表无真空度 Vacuum gauge without vacuum degree	检查连接管是否通畅，更换连接真空泵接口的电磁阀。Pls confirm the connect pipe whether unobstructed, or replace the electromagnetism valve.
2	不进油或进油量不够 Do not oil input or input is not enough	检查仪器是否真空度良好；与进油口连接的电磁阀及三通阀是否动作正常；连接管道是否通畅等。Pls check that the instrument vacuum degree is good; solenoid valve and three-way valve inlet connection and whether the operation is normal; connecting pipes is smooth and so on.
3	做废油时测试数据显示0.0% When test waste oil,the tested data is shown 0.0%	检查连接传感器一端的电磁阀是否完好 Pls Check the connected at the end of the sensor solenoid valves are in good condition.
4	开机后无任何显示 No display after opening	检查仪器电源电压是否正常，后面板保险丝是否熔断，仪器显示板与主机板上的各接插件是否脱落。Pls check instrument power voltage is in good, the fuse on the rear board whether melting and all the connectors on the instrument between display board and main board whether fall off.
5	不排油 No discharge of oil	检查压力表是否有气压，与排油接口连接的电磁阀及与气源接口连接的电磁阀是否能正常启动。 Pls check pressure gauge whether showed air pressure. The electromagnetic valve which is connected to the discharge of oil interface and solenoid valve which is connected with gas source interface can normal boot or not.

注：以上是一般的故障，你可以根据情况排除，如遇到其他故障，请与厂方协商解决办法。本仪器自货到用户单位起一年之内免费保修（在正常使用的情况下），一年以后终身负责维修，但用方需承担修理费用。

Remark: Above mentioned are generally faults, the customer can repair it according to actual situation. If met other faults, pls contact with factory to confirm resolve method.

This instrument from the customer received date, within one year, we guarantee to repair it for you in free. (Under normal using status.)

After one year, in instrument using life period, factory is responsible to maintenance and repair it, but customer needs to bear the cost of repairing.

7.仪器附件清单

VII. Instrument Accessories List

序号 Item No.	名称 Name	数量 Quantity
1	含气量测定仪 Gas content tester	1 台 1 Piece
2	含气量使用说明书 Gas content tester using instruction	1 份 1 Piece
3	电源线 Power line	1 根 1 Piece
4	真空泵及接头 Vacuum pump and connector	1 套 1Set
5	3mm 不锈钢管 3mm stainless steel pipe	1.5 米（接真空泵） 1.5 Meter for connect vacuum pump 0.5 米（接排油口）各一段 0.5 Meter for connect oil drain out (each piece for both ends)
6	针筒接头 Needle cylinder connector	1 套（接进油口） 1 set (connect inlet opening)
7	保险丝 10A Fuse 10A	3 个 3 Pieces
10	M8×1 螺帽 M8X1 Nuts	10 个 10 Pieces
11	密封垫 Sealing gaskets	15 个 15 Pieces
12	针筒支架 Needle cylinder holder	一个 1 Piece

8.本仪器所需配套设备

- 1、真空泵一台（随机配送）。
- 2、气源（内置）

VIII. Instrument Required Equipment & Accessories

1. One piece of vacuum pump (Included within instrument)
2. Gas source (Install at inside)