

HZCS-X6

Automatic Oil Acidity Tester



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I.Overview

In power system and industrial and mining enterprises have a lot of oil filled electrical equipment, transformer oil, and the acid value of turbine oil is a regular inspection items shall be measured. Insulation oleic acid value automatic tester used in transformer oil, turbine oleic acid determination instrument, adopt computer control, automatic electrical, optical, mechanical and chemical integration design, completely replaces manual operation, raised the working efficiency, reduces the labor intensity of workers, minimize the organic solvents and chemicals to the harm of human body. The operation is simple, easy to use, strong anti-interference ability, stable and reliable.

Acid value is needed to neutralize the acid in 1 gram of oil potassium hydroxide mg, in mgKOH/g oil, said it is one of the indicators should be strict in product quality control. Oil product acid value automatic tester is developed according to the standard of GB/T264-83 production, and is suitable for the detection of transformer oil, turbine oil and fuel resistance, acid value of the sample analysis of measurement. The product through mechanical, optical and electronic technology integrated use of, USES the advanced microprocessor, can automatically realize the switch samples, titration, judge titration end point and print measurement results, and other functions, the system is stable and reliable, high degree of automation. Can be widely used in electric power, chemical industry, environmental protection and other fields.

II.Functional Features

Instrument using the powerful function of a new generation of processors and new peripheral circuit, the measurement precision, high positioning accuracy, accurate and reliable of titration end point and good repeatability of experimental results.

Basically has the following characteristics:

- 1, using 320 x240 graphic dot matrix liquid crystal display screen, full screen, touch keys, friendly man-machine interface;
- 2, using neutralization titration principle, use microcomputer to control automatically add liquid at room temperature, and titration, stirring, judge titration end point, LCD screen display and can print test results.

3, color sensor coordinate titration end point detection, judgment and reliable end conditions.

4, don't need to waste liquor cup.

5, extract and neutralization liquid by a peristaltic pump control, high measuring accuracy.

6, history inquiry, instruments and automatic memory function, with the result of the experiment time automatic storage of record, and is not lost the data after power off, can be stored for more than 10 years, for later queries to print.

7 calendar clock, temperature compensation, as accurate, record the date and time, determination in power to run more than 10 years;

8, with special reagent bottle holding extract and neutralization liquid, reagent in use process not exposed to air, avoid the influence of solvent evaporation and CO₂ in the air; Users don't have to hand contact with solvents, reducing the organic solvents and chemicals to the harm of human body.

9, the equipment is simple operation, using large screen LCD and Chinese menu options, users only need to choose the menu function, according to the relevant data of the screen prompts, the instrument can automatically complete the determination of acid value.

10, the tester still can choose according to need only one sample or continuous measurement of 2-6 sample.

11, convenient communication with the computer with RS232 interface.

12, micro printer, thermal makes printing more beautiful and more quickly, with offline print function.

III. Technical Parameters

1, the power supply voltage: AC220V plus or minus 20% to 50 hz + 10%

2, determination of acid value range: 0.0001 to 0.5000 mgKOH/g

The minimum resolution: 0.0001 mgKOH/g

Accuracy: acid value between 0.001 0.1000 mgKOH/g,

Allowed error range: 0.02 mgKOH/g

Acid value between 0.1000 0.5000 mgKOH/g,

Allowed error range: 0.05 mgKOH/g

3, shape size: 420 x270x260 (mm)

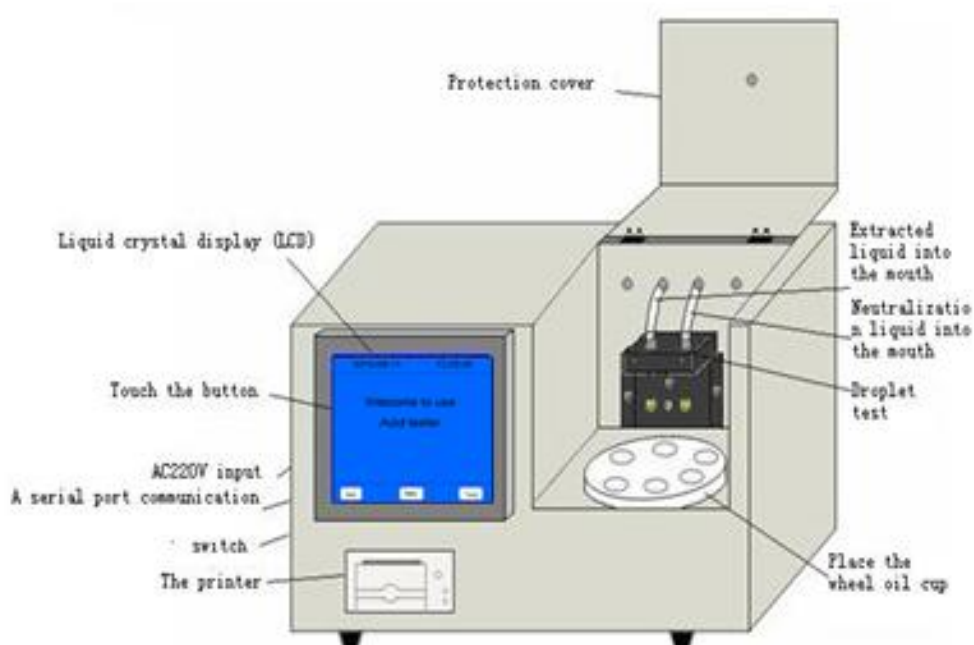
4, ambient temperature: 5 DHS C - DHS 40 C

5, relative humidity: < 85% RH

6, weight: about 9 Kg

IV. Instrument Structure

Instrument structure as shown in the figure below:



Note: can be placed in rotary table 6 oil cup, a experiment is can do no more than 6 sample.

The instrument is divided into three parts, namely, control box, mechanical transmission parts, test area. Test area is placed in the oil cup wheel, number of drops of detection device, automatic determination of acid value. Control box processing all kinds of information collection, and running commands to actuators, control box containing the LCD and touch screen at the same time, form a good man-machine communication interface. Mechanical transmission mechanism inside the chassis, peristaltic pump and mechanical drive mechanism, the control on the liquid and cup dish rotation, etc.

V.Menus and Buttons Operation Instructions

Instrument used the big LCD, a screen picture can show the amount of information is more abundant, a reduction in the number of the switch display screen, with a full-screen touch buttons, button function is clearly defined, users learn to use the instrument becomes simple.

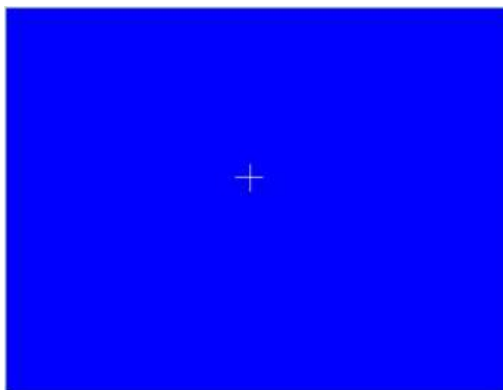
Instrument is divided into four display:

- welcome boot images;
- parameter Settings screen
- history picture;
- sample pictures;

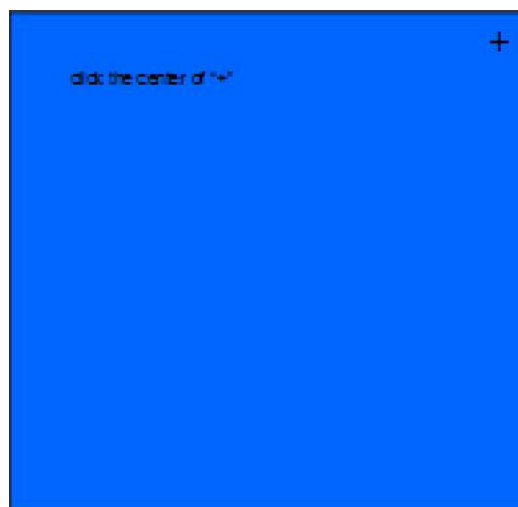
Detailed below.

1, the boot screen:

Connect good instrument power cord, turn on the power switch, the screen center cross cursor image appears, as shown in the figure below:



At this point, you can carry out touch screen calibration, the method is as follows: fingers touch the cross cursor, then into the touch screen calibration screen, as shown in the figure below:



At this point, you according to the prompts on the screen in turn five basis points (that is, the four corners and center) for calibration, the calibration after a point, cross cursor automatically moved to the next calibration point.

Note: equipment factory has been calibrated, no special circumstances, do not easily into the calibration! Remember that!

If the boot without touching the cross cursor after 2 seconds, automatically enter the boot welcome screen, as shown in the figure below:



There are three functions in the current display items to choose from:

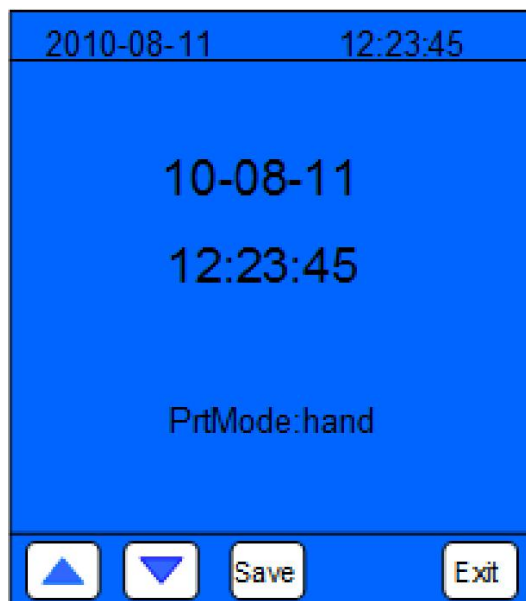
"Set.", enter the clock and the experimental parameters Settings screen

"Data:" into the historical test data

"Test" : enter the sample picture

2, the parameter Settings

Under the boot screen, press the "set." key, the LCD screen display as shown in the figure below:



Under current display screen with your finger touch to modify parameters are selected, checked, according to "increase", "decrease" button to adjust the current parameter values, press "save" to save parameters, press "exit" button to return to the boot screen.

The meaning of each parameter stated below:

Date, time, instrument of the system clock.

Print mode: indicates whether the samples after the determination of all automatic printing, "automatic" auto - print, "manual" said not automatic printing.

3, Data

Under the boot screen, press the "Data" button, can display the history of experimental records, as shown in the figure below:

2010-08-11		12:23:45	
008		008	
1-		0.071	(mgKOH/g)
2-		0.081	(mgKOH/g)
3-		0.078	(mgKOH/g)
4-		0.087	(mgKOH/g)
5-		0.079	(mgKOH/g)
6-		0.089	(mgKOH/g)
Data: 2010-08-11			
Time: 12:23:45			
pgup		pgdn	
Print		Del.	
		Exit	

pgup: the former shows a historical record, the record number plus 1, long press the key, the page forward quickly.

pgdn: show a history record, record number minus 1, long press the key, fast flip backward, minimum record number is 1.

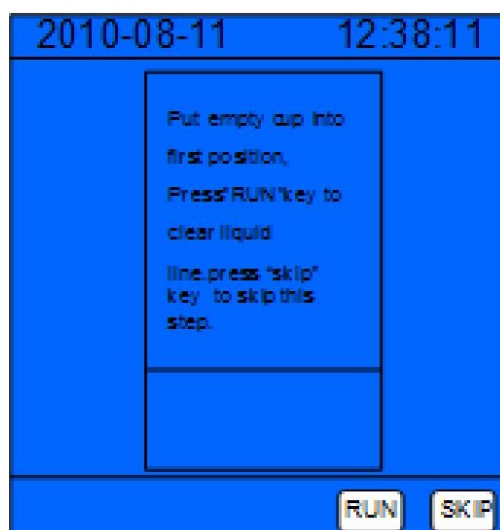
Print: print the current history records, the printing content including: 1 # sample to 6 # of the sample determination results, the inspection date and time.

Del.: delete the current record.

Exit: quit history screen, return to boot figure welcome screen.

4, RUN

Used for determine the selected oil acid value of samples, in the boot screen, press "test" button, as shown in the figure below:



One, about one and a half minutes into the testing interface automatically, as shown in the figure below:

2010-08-11		12:38:31	
Number of cup	Mass (g)	Test result (mgKOH/g)	Neutr.de. 0.025
1cup	0.512	No select	Blank Va. .0084
2cup	0.612	No select	
3cup	0.553	No select	Cur. Hue 073
4cup	0.700	No select	
5cup	0.568	No select	End hue 067
6cup	0.820	No select	
Print RUN Exit			

1, **neutralization, concentration**: the configured and night concentration (national standard and concentration in 0.02 to 0.05 mol/L), if and the concentration of the night and showed inconsistent by neutralizing night concentration increase and decrease the Numbers below to change data are stored in the instrument.

2, **blank test**: the interface is as follows

2010-08-11		12:38:31	
Number of cup	Mass (g)	Test result (mgKOH/g)	Neutr.de. 0.025
1cup	0.512	No select	Blank Va. .0084
2cup	0.612	No select	
3cup	0.553	No select	Cur. Hue 073
4cup	0.700	No select	
5cup	0.568	No select	End hue 067
6cup	0.820	No select	
Print   RUN Exit			

Used for measure the amount of acid in the extract. If change the extracted liquid,

sample test before must first be blank experiment. Method is as follows: take out a cup into the test cup, and in a grain of stirring, and then select the test cup, such as "no. 1 cup", touch the selected test cup corresponds to the "quality sample" and with "increase" and "decrease" button the samples quality is transferred to the "0.000", then the sample quality department according to "blank", as shown in the figure below. After press "start" button, the machine will automatically blank experiment operation, the end of the test instrument to beat blank blank value. (note: to observe the neutralization liquid titration speed about every drop 1 seconds) and then will finish cup to take out the blank experiment, experiment. Blank experiment process with sample determination.

3, **Cur.Hue**: is value of the color sensor, automatic detection and display instrument.

4, **End Hue**: experimental basis of titration end point, is refers to the test at the end of the value of the color, that is to say, when the current value is greater than or equal to the finish color color instrument test end, changing the method according to the finish color below Numbers increase and decrease to change data are stored in the instrument.

The buttons on the picture for the below brief introduction:

"Print" button is used to print the current measurement record.

"Add" button to modify the selected sample quality, according to one plus one, hold down the connect plus.

"Reduce" button to modify the selected sample quality, according to a minus one, hold not to put it even decreases.

"RUN" button to start the selected samples, determination of acid value.

"Exit" instrument display below



Press the "RUN" key instrument cleaning, press the "SKIP" key instruments automatically return to the main interface, press "RUN" again during the cleaning process can stop, cleaning about 1 1/2 minutes automatically enter the main interface,

Note: if you quit is not to continue the line experiments, please cleaning operations, or you can press "SKIP" exit

Sample test: used to determine the acid value of crude oil sample. After open, the oil cup of sample have as the wheel set cup, and stir into a grain. And then select the corresponding cup, as follows: in "test cup selection" column, use finger to touch the cup, were selected, checked, touch again, uncheck, as shown in the figure below:

2010-08-11		12:38:31	
Number of cup	Mass (g)	Test result (mgKOH/g)	Neutr.de. 0.025
1cup	0.512	No select	Blank Va. .0084
2cup	0.612	No select	
3cup	0.553	No select	Cur. Hue 073
4cup	0.700	No select	
5cup	0.568	No select	End hue 067
6cup	0.820	No select	
Print   RUN Exit			

After selected test cup, then input the corresponding sample quality, the method is as follows: in "Mass" column, with your fingers touch the data, to select, then press the "add", "decrease" button to adjust parameters, as shown in the figure below:

2010-08-11		12:38:31	
Number of cup	Mass (g)	Test result (mgKOH/g)	Neutr.de. 0.025
1 cup	0.512	No select	Blank Va. .0084
2 cup	0.612	No select	
3 cup	0.553	No select	Cur. Hue 073
4 cup	0.700	No select	
5 cup	0.568	No select	End hue 067
6 cup	0.820	No select	
Print   RUN Exit			

After all the input, press the "RUN" key are measured, and the process used in the determination of the "Test result" column indicates, display information such as location... And extraction... , and... End determination, cancellation, etc.

Multiple oil cup, according to 1 cup, 2 cups,... The sequence, 6 cup automatic measurement, until all finish measurement.

VI.Out of The Installation

- 1, when unpacking the case firmly laid instrument laboratory work platform.
- 2, take a beaker in random with 80 ml water, potassium hydroxide dissolves adequately, then inject gas bottle.
- 3, to extract randomly with the bottle injection extract (liquid level shall not be higher than 500 ml scribed line).
- 4, open the back panel, the extracted liquid bottle and the neutralization liquid bottle into the fixed bottle hole at the back of the instrument.
- 5, on 220 v power supply. Note: 220 v power supply should be good grounding line!

VII.Test Steps

- 1, open the power supply, instrument display page.
- 2, experiments: blank, if change the extract, blank experiment must do first before sample test. Get empty cup into one cup, and stir into a grain. Adjust the sample quality is "blank", press "start" button, the machine will automatically blank experiment operation. (note: to observe the neutralization liquid titration speed about every drop 1 seconds) and then will finish cup to take out the blank experiment, experiment.
- 3, sample test:
 - 1) press "set." key in the boot screen, enter the parameter setup screen, enter the neutralization liquid concentration.
 - 2) with finger touch to modify parameters are selected, press "add", "decrease" button input neutralization liquid concentration.
 - 3) press the "RUN" key in the boot screen, enter the sample picture.
 - 4) sample weighing: sample with a syringe, insulating oil, and the quantity of turbine oil is 8 ml, fire-resistant oil to 1 ml, said its net weight number and record a cup.
 - 5) will the oil cup into the cup to the number plate, respectively, in a stirring.
 - 6) with your fingers touch the selected experimental cup corresponds to the sample quality, and quality of input samples.
 - 7) press the "RUN" key to determine sample automatically.
 - 8) every finished a sample, the screen shows the test results, for the sample set is

complete, the instrument will automatically print the measuring results (if you choose the automatic printing function).

VIII.Use the Matters Needing Attention

- 1, test the cup must be cleaned with anhydrous ethanol, stay dry rear can use.
- 2, pay attention to the determination of acid value before, must first blank experiment, if a measuring cup sample can make a blank experiment. If the time interval is longer or the environment temperature changes, the each measured sample before to do an blank test. Please confirm and check whether it is the first cup of cup into the stir bar magnet.
- 3, special remind: blank test, neutralization liquid drop speed must not be too fast, or you will make the drop testing is not accurate, affect the experiment result.
- 4, if a blank test, open cover, the sample inspection should also uncovered protective cover, when the ambient light is consistent before and after the test.
- 5, experimental oil cup cup dish, the pallets must ensure that the bottom is completely inside the cup, in order to avoid cup set is not straight, effect light detection.
- 6, every cup after the experiment must be removed from the cup dish, to avoid impact position when doing the experiment again.
- 7, at the end of the experiment, and fluid and extraction fluid bottle should be placed on shading in sealed preservation, avoid deterioration failure.

IX.Failure Phenomenon and Elimination Method

- 1, the neutralization liquid droplet, slow or little.
 - 1) Possible and liquid bottle cap not tighten, air leakage. Tighten the lid.
 - 2) Likely due to not completely clean, make the neutralization titration needle clogging

Processing method:

Replace # 4.5 needles, adjust the tilt Angle of the needle, the droplet number detection accuracy.

- 2, low acid value oil test results appear error 0.0001 mgKOH/g or phenomenon.

Solution: need to blank experiment. To ensure that the blank experiment must be accurate.

X.Install Printer Paper

1, installation on paper and paper and turn the printer front cover, and hold a fixed head on either side of the machine head plate elastic card, pull pull the nose plate is about 2 mm, turn on the printer power and printer paper after three lines, enter the standby state, the indicator lights. Click on the button, indicator light out, and then hold down the button more than one second, printer paper began to walk; Or hold down the button directly more than 1 second, printer paper began to walk. After the front end of the printing paper cut into triangles, printing paper into the printer back into paper, printing paper will be involved in printer. Typed to stay out of the printer head above the mouth out of a paper, click on the button to stop the feeding, automatic into the indicator on standby. Hold hold elastic shaft at both ends of the paper, the elastic paper roll on the shaft can be installed to the paper shaft frame.

2, detection, and the printer power off, hold the SEL button to switch the printer on, after the printer into the self-test, print out the self-checking list.

Customers can according to need to matching JA2003N electronic balance (0.001 g).