Dear Client,

Thank you for purchasing our HTYND-H Kinematic Viscosity Tester. Please read the manual in detail prior to first use, which will help you use the equipment skillfully.

Our aim is to improve and perfect the company's products continually, so there may be slight differences between your purchase equipment and its instruction manual. You can find the changes in the appendix. Sorry for the inconvenience. If you have further questions, welcome to contact with our service department.

The input/output terminals and the test column may bring voltage, when you plug/draw the test wire or power outlet, they will cause electric spark. PLEASE CAUTION RISK OF ELECTRICAL SHOCK!

Company Address:

- **T4， No. 1, High-tech 2 Road，East Lake High-tech Development Zone， Wuhan**
- Sales Hotline: 86-27- 87492243
- After Service Hotline**:** 86-27- 87459656
- Fax: 86-27- 87803129
- E-mail: whhuatian@163.com
- Website: www.whhuatian.com

SERIOUS COMMITMENT

All products of our company carry one year limited warranty from the date of shipment. If any such product proves defective during this warranty period we will maintain it for free. Meanwhile we implement lifetime service. Except otherwise agreed by contract.

SAFETY REQUIREMENTS

Please read the following safety precautions carefully to avoid body injury and prevent the product or other relevant subassembly to damage. In order to avoid possible danger, this product can only be used within the prescribed scope.

Only qualified technician can carry out maintenance or repair work.

--To avoid fire and personal injury:

Use Proper Power Cord

Only use the power wire supplied by the product or meet the specification of this produce.

Connect and Disconnect Correctly

When the test wire is connected to the live terminal, please do not connect or disconnect the test wire.

Grounding

The product is grounded through the power wire; besides, the ground pole of the shell must be grounded. To prevent electric shock, the grounding conductor must be connected to the ground.

Make sure the product has been grounded correctly before connecting with

the input/output port.

Pay Attention to the Ratings of All Terminals

To prevent the fire hazard or electric shock, please be care of all ratings and labels/marks of this product. Before connecting, please read the instruction manual to acquire information about the ratings.

Do Not Operate without Covers

Do not operate this product when covers or panels removed.

Use Proper Fuse

Only use the fuse with type and rating specified for the product.

Avoid Touching Bare Circuit and Charged Metal

Do not touch the bare connection points and parts of energized equipment.

Do Not Operate with Suspicious Failures

If you encounter operating failure, do not continue. Please contact with our maintenance staff.

Do Not Operate in Wet/Damp Conditions.

Do Not Operate in Explosive Atmospheres.

Ensure Product Surfaces Clean and Dry

—Security Terms

Warning: indicates that death or severe personal injury may result if proper precautions are not taken

Caution: indicates that property damage may result if proper precautions are not taken.

Contents

First, Summary

HTYND-H Oil Viscosity Tester of petroleum products automatic tester with GB/T265-1988 the kinematic viscosity of petroleum products determination method and calculation of dynamic viscosity ", suitable for the determination of kinematic viscosity of liquid petroleum products (Newtonian fluid). The method is refers to under a constant temperature and determination of a certain volume of liquid under gravity through a calibrated glass capillary viscometer time, product of viscometer capillary constant and flow time, namely the temperature determination the kinematic viscosity of the liquid (the temperature kinematic viscosity with temperature of liquid density plot for the temperature of liquid dynamic viscosity).

HTYND-H Oil Viscosity Tester automatic measuring instrument, using advanced fuzzy PID temperature control technology, accurate temperature control, accuracy of up to 0.02. Can be set to 20 DEG C, 40 DEG C, 50 C, at a temperature of 80 DEG C and 100 DEG C, a national standard of temperature control and set arbitrary temperature temperature (set temperature to above room temperature), set the temperature resolution of 0.1 DEG C can be used as a common thermostatic water bath.

HTYND-H Oil Viscosity Tester of petroleum products automatic determination instrument, can be enabled at the same time 4 pieces of glass capillary viscometer was under the same temperature determination of kinematic viscosity and every viscometer can be repeatedly measured 4 times as a set of test data. The instrument will according to the requirements of national standard method for automatic removal of which does not comply with the tolerance of the timing results, and several other conforms to the tolerance of the timing value of average value, calculation and obtain the values of the kinematic viscosity of the group test. When does not need to obtain accurate measurement results (often to roughly observe unknown samples approximate kinematic viscosity value), will count the number of set for smaller values, such as once, twice or three times, the test sample approximate kinematic viscosity values obtained in a relatively short period of time, after modify the timing number is 4 times, strictly in accordance with the national standard method

requirements to get the exact value of sample and test the final kinematic viscosity.

HTYND-H Oil Viscosity Tester of petroleum products automatic determination instrument with high resolution color touch screen technology, rich interface, clear, touch screen response fast and flexible; the large capacity memory chips up 2000 results; the panel mounted thermal printing machine, end of the assay, automatic printing rapid determination of results and sample number, determination of time, viscometer constant, diameter, kinematic viscosity value information preservation.

Two, technical parameters

Display device: color LCD display + touch screen

Temperature range: ~150

Setting temperature: 20, 50, 80, 100, 40 (higher than ~150).

Temperature control accuracy: 0.02

Test hole number: 4 hole

Time range: 0~999 seconds (according to the national standard requirements, the flow time of each test sample is higher than 200 seconds)

Time accuracy: 0.1 seconds

Time: 1~4 times optional

Storage capacity: 2000 test records

Print mode: panel mounted thermal printer

Power source: AC220V 5% 50Hz 5%

Work rate: 1600W

Using environmental temperature: 5 ~35

Using ambient humidity: 10%~80%

Three, instrument structure

1 instrument to face up to figure (Figure 1)

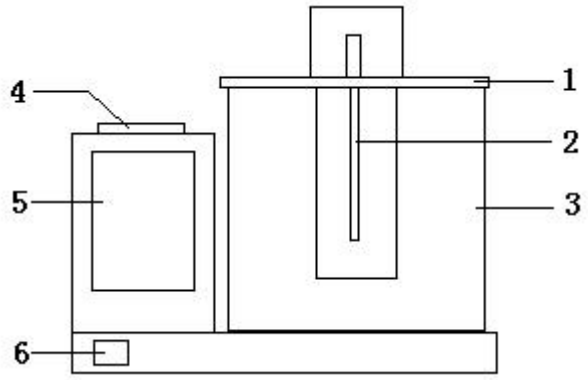


Figure 1

(1) the constant temperature water bath cap assembly

(2) temperature sensor

(3) water bath

(4) printer

(5) liquid crystal display

(6) power switch

2 view (Figure 2).

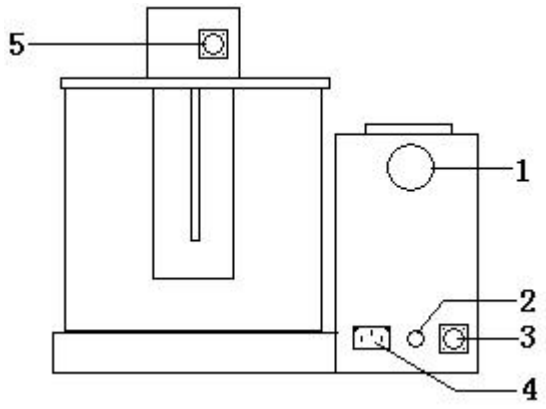


Figure 2

(1) cooling fan

(2) fuse box

(3) host terminal control cable outlet

(4) AC power outlet

(5) water bath end control cable socket

3 bath cover map (Figure 3)

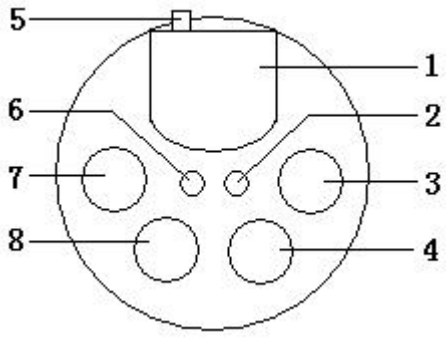


Figure 3

(1) water bath control box (2) temperature sensor hole (3) 4 viscometer hole (4) 3 viscometer hole (5) end of the bath control cable socket (6) mercury thermometer socket (7) No. 1 viscometer hole (8) No. 2 viscometer hole

Four, function introduction

According to the different interface, the instrument functions are as follows:

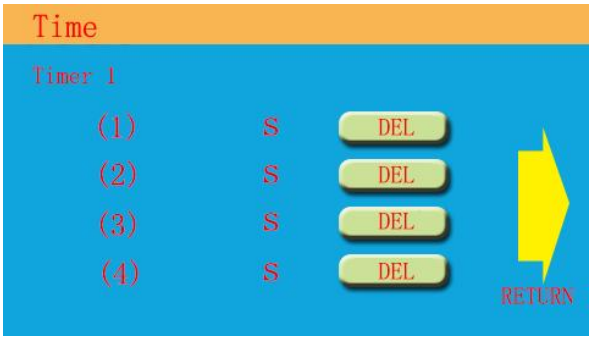
1 boot display instrument name, click on the screen at any position, show the test, ready to work, data record function selection menu.

2 test interface:

As shown above and below the interface has four buttons "control", "stop", "parameters", "back", click "control", according to the set temperature control temperature, at this time, "control" button is disabled. If you need to stop temperature control, can click on the "termination", at this point, the "stop" button failure, "temperature control" for the effective state. Click the "parameters", can enter the 4

glass tube diameter, constant set interface. Click "return" to exit the interface. Above the temperature display real-time temperature, is below the set temperature value, four side by side of timer (number 1, 2, 3, and 4 from the left and right in turn corresponds to a water bath cap 4 pieces of glass viscometer, parameter setting interface diameter, constant significance similar) with a resolution of 0.1 of a second time, the timer dial just below is four timer current time values. Click on the dials to the beginning of time, click again on the termination time, and eject the timer has timing interface, such as no any operation. After a few seconds the interface will automatically exit, such as delete, and click on the "back" to exit timing interface. Such as the end of the time has reached the average number of times to set the average number of times, then a direct result of the movement of the viscosity of the test results. At any time, click on the clock dial below the time value, but also to enter the time of the interface, to return to the".

Time interface is as follows:

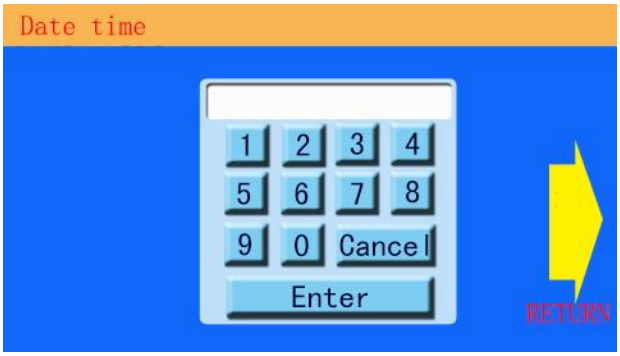


In the interface "(1)", "(2)", "(3)", "(4)" refers to the 4 consecutive time the same value viscometer.

Click the "delete", delete the corresponding time value (in that the timing is obviously wrong use), after the timing value locations in order to move forward.

Kinematic viscosity calculation results interface shows the corresponding glass viscometer is a group of time after the determination of kinematic viscosity results, the unit is mm2/S. Click "exit" to return to the test interface. If you don't click "exit", after a few seconds, automatically exit.

The test interface is displayed in the middle of the time, and the time can be entered into the setting time:



Click on the top of the screen in real time, soft keyboard above the digital input area show "20? -? -? ?? :? :?" , followed by the year, month, day, hour, minute, second (all 2 digits), and click "OK", the time is modified. Click "return" to exit the time setting interface.

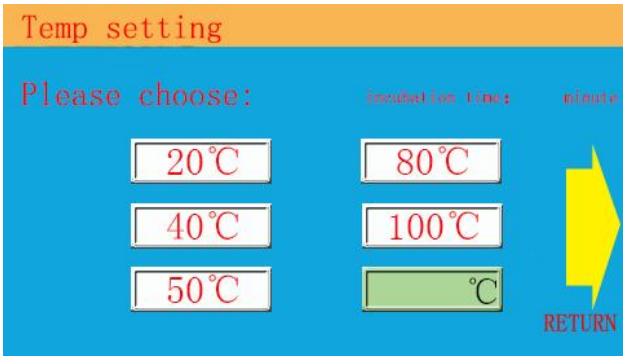
3 ready to work interface:

The interface contains four functions: the set temperature, printer settings, viscometer parameters (diameter and constant) setting and timing values (with a glass capillary viscometer with a group of test taking multiple timing value) a set number of times.

(1) constant temperature setting interface (see next page):

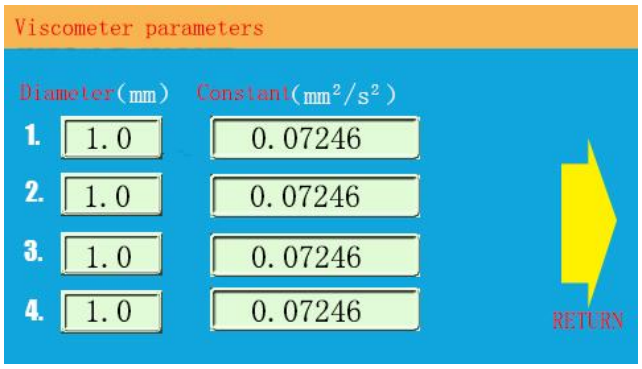
The symbol "V" which is located in the back of the set value, which means the set temperature value. Click to select different temperature values. When click on the lower right corner of an arbitrary temperature set value into arbitrary control

temperature setting interface, interface suggested by the text, first click digital input, input to be set of control temperature values, click on the confirmation (".") after the entry into force. If you want to cancel this input in the middle of the digital input, you can click on the "CE" in the soft keyboard ". Click "return" to exit any temperature setting interface.



(2) printer settings: after clicking on the printer settings interface, you can choose to enable / disable the printer ". End of the test, the instrument is set to print (set to enable the printer) or not to print (when the printer is set to the printer) to determine the result.

(3) viscometer parameters:



The left column interface parameter settings for the diameter of glass capillary viscometer, unit: mm. The right column is constant, the corresponding viscometer unit: mm2/s2. Click to modify the parameters that are transferred to the rear of the

parameters, that are editing the parameters, and pop-up parameter modification interface (diameter changes, input and constant revision, input), to modify the parameters, first of all need to click on the left side of the parameter display area, can input corresponding to be modified digital and click on the "right" to confirm. To cancel the digital input, click OK "-" click on the "CE" just before removal of the digital input.

(4) the time setting of the time value

The timing number refers to the same glass the same test for time frequency, range: 1~4. Set to 1 times, timing immediately at the end of the measurement results are shown; setting is 2 times, 2 consecutive tests of time average value as the timing; a set number of times for 3 or 4 times, value method has two: A. take more than 3 consecutive time average value when a direct calculation results; B. take more than 3 consecutive time average values, abandon time exceeding value. Using the method of "A.", direct calculation repeatedly time average value as the time value, kinematic viscosity of the final value is obtained; using method "B.", according to the national standard methods, throw away the time exceeding value, take another few timing value arithmetic average as the time value, kinematic viscosity value is obtained by.

4 data record interface:

The interface shows the test record of the viscosity of the test, including the test

number, the test time and the viscosity value of the 3 items. The function button to "turn", "turn", "clear", "return" ------ click on "turn", recorded data to page, click on the "turn", recorded data page down; click "clear", pop-up delete records reminder dialog box, in the dialog box, click on the "OK", will empty data recording, click "Cancel", exit the dialog box. Click "back", exit data recording interface.

Five, using method

1 Preparation

(1) reagent preparation:

Shi petroleum ether: 60-90.

95% ethanol: chemical purity.

(2) sample pretreatment:

When the sample contains water or mechanical impurities, it must be removed before testing, and the mechanical impurities are removed by filter paper.

For the large viscosity of lubricating oil, can be used in the porcelain funnel, water pump or other vacuum pump for suction, can also be heated to the temperature of the 50~100 at the temperature of dehydration.

(3) glass capillary viscometer selection: Determination of kinematic viscosity of the sample, selection of appropriate viscosity according to the test temperature, provided the sample flow time less than 200s, the flowing time of the viscometer inner diameter 0.4mm less than 350s.

(4) glass capillary viscometer test before treatment: before the determination of the sample viscosity, must with solvent oil or petroleum ether washing viscosimeter, if viscometer is stained with dirt, chromic acid, water, distilled water or 95% ethanol followed by washing. And then put in an oven for drying or blowing dry with hot air through the cotton filter.

(5) constant temperature water bath preparation: according to the temperature, to bath into the amount of thermostatic liquid (thermostatic liquid type see Table 1).

Table a constant temperature bath liquid at different temperatures.

TEM[，℃	Constant temperature bath liquid
50~100 20~50	Transparent mineral oil, glycerin (glycerol) or 25% ammonium nitrate solution Water

(6) sampling: Determination of kinematic viscosity, when the diameter of specimen is loaded with capillary viscometer, in dry and clean requirements. Before loading the sample, the rubber sleeves on branch 7, and with his finger blocked tube body 6 nozzle, also inverted viscometer. Then the tube body 1 is inserted into the sample container. When the rubber pipette bulb will liquid suction to marking B, while taking care not to make the tube body 1, expansion part 2 and 3 in the liquid bubbles and cracks. When the liquid level reaches the mark B, filed a viscometer from the vessel, and quickly restored to its normal

State, while the tube body one end of the tube outer wall of the stained with excess sample rub to and from branch 7 to take the rubber sleeves in the pipe body 1 (Figure 4).

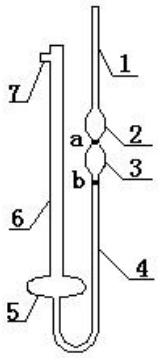


Figure 4

(7) is mounted viscometer: with viscometer immersion of samples in advance ready thermostatic water bath, and with the clip will viscometer fixed on the bracket, in a fixed position must the capillary viscometer is the expansion part 2 immersed in half (Figure 5). Observation of the viscometer, in a vertical state.

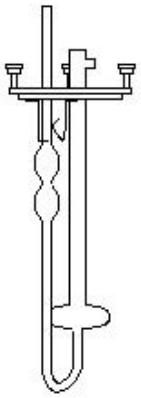


Figure 5

2 sample test

(1) control cable with instruments owned connected host and the constant temperature water bath above a roof control box;

(2) set a good constant temperature, the instrument on the date, time, time, etc.;

(3) the diameter of the glass viscometer placed in a water bath and constant values, input device, set the printer (enable or disable print).

(4) into the experimental interface, click "control", the instrument automatically heating and control to set the temperature. After a certain time of constant temperature, constant temperature time see Table 2), with capillary viscometer tube body 1 with a rubber tube sample suction expansion part 3, sample level slightly higher than the standard line a, and be careful not to let the capillary and the expanded part 3 of the liquid bubbles or cracks. Observation of the specimen in the tube body of the flow, liquid level coincides with the arrival of marking a, start the stopwatch; liquid level just flow to marking B stop the stopwatch. When the liquid level of the sample is flowing in the expansion part 3, it is noted that there is no bubble in the expansion part 3. Repeat the experiment, when the number of trials to set the number of times, if the time value is in accordance with the requirements of the national standard (the timing and the arithmetic average value of the difference in temperature for 15 ~ 100 DEG C should not be more than arithmetic mean value of + 0.5%), the calculation the time average values and shows the kinematic viscosity of the measured values. Such as the time value does not meet the requirements of the poor, then the failure of the test failed to remind the operator to re test. Usually set the

number of times for 4 times, and set up 3 times more than the test, give up the time difference to calculate the results of the test results.

Test, four capillary viscometer test tubes, mutual influence, after starting a viscometer test time, and then start another viscometer test time. Processing method.

Six, note

1 after startup, such as the water is not water, and can not open the test "control" function, to avoid damage due to dry burning heater.

Viscometer in constant temperature in the constant temperature bath time

temp，℃	time，min
80, 100	20
40, 50	15
20	10

2 such as the maximum temperature display (150), may be caused by the loose connection cable, can be re tighten the cable plug;

3 water bath cover is arranged in the water bath, tohandlegentlyand, avoid bad water bath.