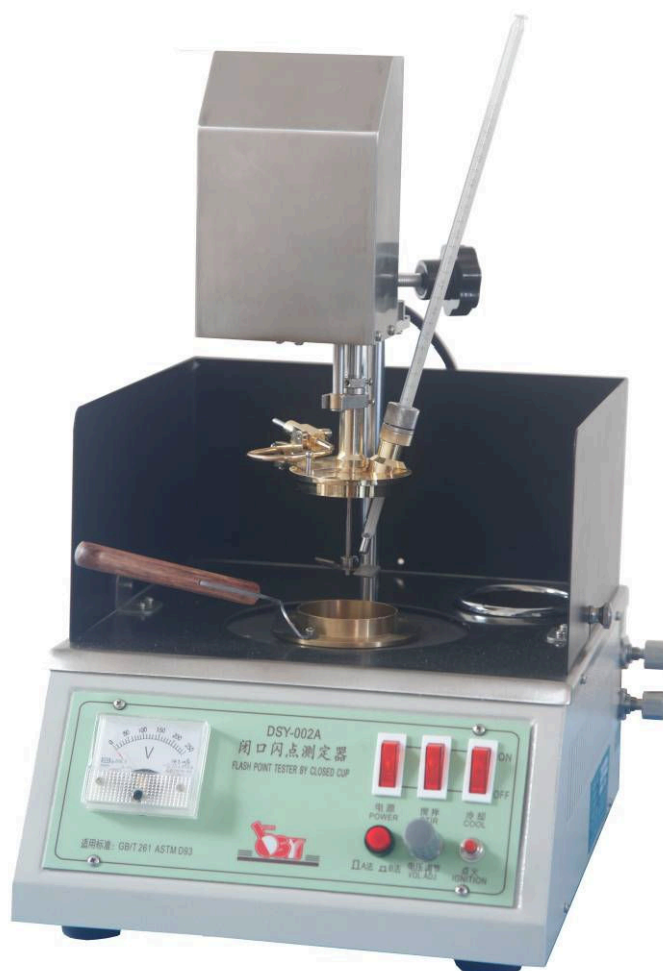


Flash Point Tester
(PENSKY MARTENS CLOSED CUP METHOD)
MODEL DSY-002A

Operation Manual



DALIAN PETROLEUM INSTRUMENT CO., LTD.

INSTRUCTION

Thank you for choosing GAOHE instruments manufactured by Dalian Petroleum Instrument Co., Ltd. (hereafter referred to as “GAOHE”).

This User Manual is provided to guide you through proper use and maintenance of GAOHE instrument.

To ensure your safety and test result accuracy, please read this manual carefully BEFORE installation and operation. Should you have any question or need further information please contact our field technician or email foreign@dsy1988.com.cn

Please keep this manual for your future reference.

SAFETY WARNING

Please double check input voltage and ground resistance BEFORE POWER ON, make sure instrument has electrical GROUND CONNECTION, and there is no short circuit.

To prevent electric shock and short circuit, MUST POWER OFF when moving and/or repairing instrument. Turn off power when instrument is not in use.

DISCLAIMER

Warranty will not be provided in case of the following circumstances.

- (1) Improper operation
- (2) Operation under abnormal environment
- (3) Abuse or unauthorized alteration of instrument
- (4) Unexpected incident
- (5) Force majeure etc.

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1 General

1.1 Characteristics

DSY-002A is designed according to ASTM D93 by Pensky-Martens method, it is suitable to the determination of flash point of flammable liquid, liquid with suspended particles, petroleum liquid that tend to form a surface film under test conditions, and other liquid with flash point above 40°C. It is not applicable to liquid with high volatility or containing water or paint.

Main characteristics:

- ◆ Temperature rise controlled by SSR, which can satisfy requirements of different heating rate.
- ◆ Continuously stirring the sample and stirring is auto stopped during igniting.
- ◆ Electrical controlled ignition.
- ◆ Vertically installation of test device, after test, raise the test device, the sample attached on stirrer will drop into test cup so as to maintain the instrument clean.

1.2 Operation condition

- ◆ Temperature: 5°C~35°C Humidity:≤85%
- ◆ Condition: No dust, no corrosive gas and no influence of strong magnetic field.
- ◆ Power supply: 220V±22V, 50Hz, 5A grounded electrical socket
- ◆ Gas source: Liquid petroleum gas or propane

1.3 Configuration

The instrument consists of main body, test device, control unit, test cup and gas source. see Figure-1.

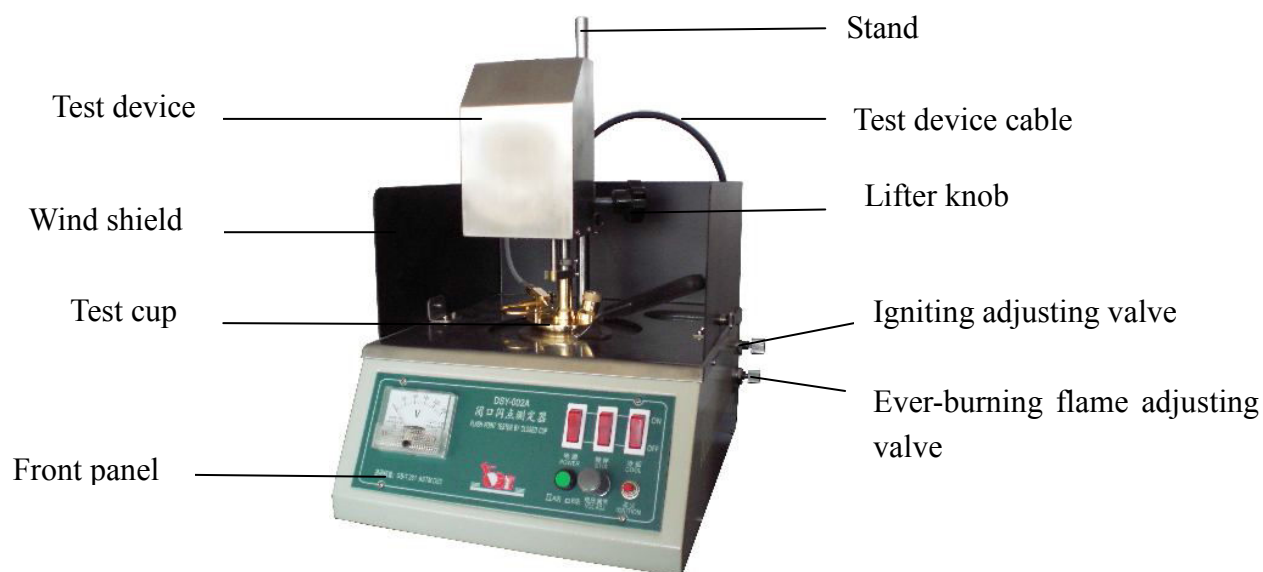


Figure-1 Configuration

1.3.1 Test device

The test device consists of stirrer, electrical control igniting system, disassemble test cup lid and igniter. It uses vertical model for ensuring the close seal between test cup and cover and precise test result. During test, the stirrer, test cup lid, igniter and shutter unit are linked together, release the lifter knob to drop the test device onto test cup to finish the operation.

Shutter unit: The motor drives the cam and driving axle to open or cover the shutter automatically.

1.3.2 Heating device

The heating voltage is adjusted by SSR, it is convenient to control the power frequency to meet different requirements on temperature rise rate.

1.3.3 Gas source

Beside master gas valve, we have adjusting valves for flame size adjusting for both igniting and ever-burning flame.

1.4 Dimension and weight

Dimension: 380 x 280 x 400 mm

Weight: 10 kgs

1.5 Main parameters

Heating power: 0 ~430W adjustable

Flame can be adjusted to 3~4mm

String rate: 105rpm (Method A); 250rpm (Method B)

2 Installation and commissioning

2.1 Unpacking and checking

2.1.1 Open the packing case and put instrument out, check if the apparent clean and without damage, and put the instrument on test platform steadily.

2.1.2 Unpack the accessories carefully and inspect them according to “Accessory list”. Contact us if any shortage or damage. Start installation if no objection.

2.2 Installation requirement

2.2.1 The instrument should be placed on steady test platform with no airflow around.

2.2.2 The distance between instrument and the walls or other shields should be not less than 200mm.

2.3 Installation and adjustment

2.3.1 Installation

Sleeve the test device onto the stand and adjust the position using the lifter knob. Place the test cup into stove, and insert the thermometer (by client) into holder. Connect the cables for power and test device into corresponding sockets. Connect the igniter and pilot to corresponding adjusting valves with silicon tubes. (See Figure-2)



Figure-2 Rear view

2.3.2 Adjustment

2.3.2.1 Pull the driving axle by hand to observe the flexibility of the sliding unit (see figure-3).

If any trouble, inspect at each transmission joints for any loosening or barrier. Contact us if the trouble cannot be solved.

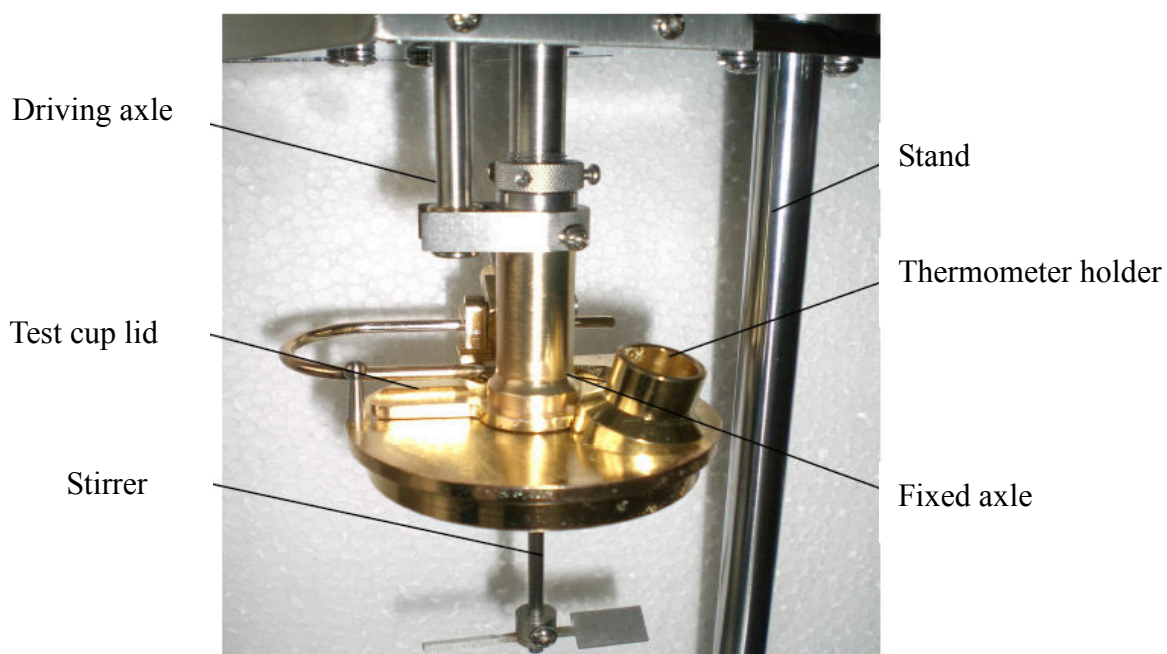


Figure-3 Test device

2.3.2.2 Move the stirrer and observe if it can touch the thermometer, if yes, adjust the position of blade.

2.3.2.3 Gas source connection: Turn off the master gas valve and adjusting valves, connect the gas source with the master gas valve. When igniting, turn on the master valve (Fully or half open depending on the gas pressure), and turn left the igniting adjusting valve slowly to adjust diameter of flame to standard size.

Note: When igniting, dispose the air in the tube and then adjust the valve slowly, carefully control the size of flame within stated range, so as to avoid fire hazard.

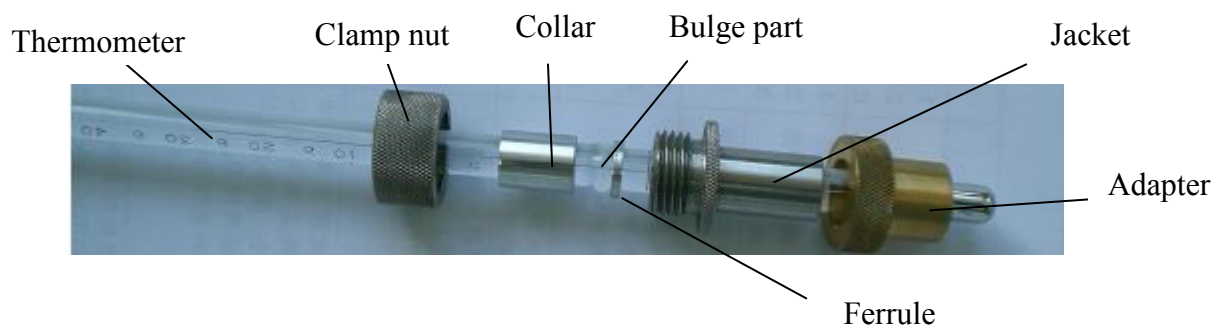


Figure-4 Thermometer installation

2.3.2.4 Please see Figure-4 for the installation of thermometer. Place the Ferrule under the bulge part and then screw the clamp nut onto the jacket to fix the thermometer (do not too tight to make thermometer broken). Insert them into the thermometer holder.

3 Operation

3.1 Commissioning

3.1.1 Power supply

Turn on “Power” switch and the light works.

3.1.2 Voltage adjustment

Turn the voltage adjusting wheel clockwise to the end, the pointer will be from 0 to maximum, otherwise the pointer will be from maximum to 0.

3.1.3 Choose stirring rate

Turn on “STIR”, stir motor starts working. Observe if the stirrer blade is flexible and if stirring is even. Choose Method A and the stirring rate will be 105rpm; choose Method B and the stirring rate will be 250rpm.

3.1.4 Igniting

Push down “FIRE” button on control panel, shutter slides and door opens within half second, igniter descends to test cup’s vapor space and stays for 1 second before self-reset. When igniting, stir motor automatically stops.

3.1.5 Cooling

Turn on “COOL” and observe if the fan works.

3.2 Operation

3.2.1 Preparation

After successful commissioning, instrument can start normal operation. For testing operation procedures, see ASTM test method standard.

3.2.2 Heating rate

Turn on "POWER", choose "method A" or "method B". Turn on "STIR", stir motor starts working. Adjust "Voltage Adjust" button and start heating test sample. Observe thermometer temperature, and adjust voltage to obtain desired heating speed. (Method A: 5~6°C/min, Method B: 1~1.6°C/min).

3.2.3 Test condition

Get through the gas source and ignite the ever-light flame and pilot flame, adjust the size of pilot flame to 3mm-4mm, and adjust ever-light flame to a little bigger. Press "FIRE" for 1 second, the pilot flame will be descended.

Selection of the temperature in First time ignition

Expected flash point	The temperature of the first time ignition	Ignition frequency
<110°C	Below the expected flash point 23±5°C	Temperature Increase 1°C, ignition 1 time
>110°C	Below the expected flash point 23±5°C	Temperature Increase 2°C, ignition 1 time
The temperature difference between flash point and the first time ignition are from 18°C to 28°C, the test result is effective.		

3.2.4 When test operation is complete, adjust voltmeter back to "0", turn off "STIR", switch off gas source, turn on cooling fan, now starts cooling down of heater and test sample.

4. Trouble and trouble shooting

Trouble	Cause	Solution
Power indicator light is dark	<ol style="list-style-type: none"> 1. Power is disconnect 2. Power switch is broken 3. Fuse is broken 	<ol style="list-style-type: none"> 1. Check if power socket is connected 2. Replacement 3. Replacement
Voltmeter shows "0"	<ol style="list-style-type: none"> 1. Potentiometer has open circuit 2. SSR has open circuit or loop is broken 	<ol style="list-style-type: none"> 1. Replacement 2. Replacement or connected broken loop
Voltmeter shows "220V"	<ol style="list-style-type: none"> 1. SSR is broken 	<ol style="list-style-type: none"> 1. Replacement
Stir motor does not work	<ol style="list-style-type: none"> 1. Stir switch is broken 2. Motor gets stuck 3. Motor is damaged 	<ol style="list-style-type: none"> 1. Replacement 2. Adjust shaft lever in main shaft, clean up dirt 3. Replacement
Ignition motor does not work	<ol style="list-style-type: none"> 1. Ignition switch is broken 2. Motor is damaged 	<ol style="list-style-type: none"> 1. Replacement 2. Replacement
Test cup door opening does not reach in the place	<ol style="list-style-type: none"> 1. Turn and shift test cup 2. Time period when pressing on "FIRE" button is too short 	<ol style="list-style-type: none"> 1. Loosen screw on main shaft, adjust turning angel of test cup lid, when open/close door freely, tighten screw 2. Press on "FIRE" button for a longer period of time
Test cup lid does not self-reset after door opening	<ol style="list-style-type: none"> 1. Space between shutter and test cup lid is too small, friction force is too large 2. String pulling strength is too small 3. Test cup lid is turned or shifted 	<ol style="list-style-type: none"> 1. Loosen screw nut on top of shifting folk, turn screw nut to adjust space between shutter and test cup lid. 2. Replace string 3. Loosen screw nut on main shaft, adjust angel of test cup lid, when open/close door freely, tighten screw nut
Stir motor is too noisy	Stir paddle and stationary shaft are not homocentric, friction occurs.	Open exterior case of instrument, loosen the screw fixing motor, adjust position of motor support board to make stir shaft and stationary shaft homocentric
Fire go out when ignition	<ol style="list-style-type: none"> 1. Test flame too small 2. Disturbing air flow 	<ol style="list-style-type: none"> 1. Adjust flame size 2. Prevent air flow

5. Maintenance

5.1 The instrument should be placed at a draft and dry place.

5.2 After test, the test cup and all parts related to the sample steam should be clean

5.3 The instrument should be covered by cloth after being used.

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