

Dear Client,

Thank you for Purchasing our HTMD-H SF6 Density Relay Tester. Please read the manual in detail prior to first use, which will help you use the equipment skillfully.



Our aim is to continually improve and perfect the company's products, 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 test wire or power outlet, they will cause electric spark. PLEASE

CAUTION RISK OF ELECTRICAL SHOCK!

Company Address:

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◆ **SERIOUS COMMITMENT**

Within three months from the date of delivery, if our products have quality defects, implementation of replacement; in one year (including one year), repair for free; more than one year, implementation of lifetime maintenance and appropriate fees are required. Except otherwise provided by contract.

◆ **SAFETY REQUIREMENTS**

Please read the following safety precautions carefully to avoid body injury and prevent the product or other relevant subassembly 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 Wire and Charged Metal /Conductor

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.

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Please read the instructions carefully before using the instrument.

To connect or disconnect the charger should first turn off the power switch on the meter, or may damage the instrument !!

Principle of the instrument:

Sealed in a container of gas pressure is varied with the change of temperature, in order to have a uniform standard for comparison, we usually set the relative pressure at 20 °C values as the standard values. When the density meter calibration is according to the corresponding relationship between pressure and temperature into the equivalent pressure at 20 °C value, and then compare.

Atresia reply check:

In the SF6 density relay pointer to zero, to the relay uniform slow inflation, when the SF6 density relay a locking action, recording at ambient temperature and pressure, converted into the equivalent pressure at 20 °C, the equivalent pressure value is the blocking of SF6 density relay return value.

Alarm response value check:

For SF6 density relay uniform slow inflation, when the SF6 density relay alarm action, record the ambient temperature pressure value, and converted into the equivalent pressure at 20 °C, the equivalent pressure value is the return value SF6 density relay alarm.

Over-pressure return value check:

For SF6 density relay uniform slow inflation, when the SF6 density relay issue over-pressure signal, began a slow speed for SF6 density relay deflated when the relay over-pressure alarm signal, recording the temperature pressure value, and converted into the equivalent pressure at 20 °C, the equivalent pressure value is over-pressure return values for SF6 density relay.

The alarm value check:

At ambient temperature, when the pressure is higher than the value in the SF6 density relay alarm response value, began to slow release, when SF6

density relay alarm signal recorded at ambient temperature and pressure, conversion to equivalent pressure at 20 °C, the equivalent pressure value is the value of SF6 density relay alarm.

Lock value check:

For SF6 density relay moving slowly deflated, when SF6 density relay a blocking signal, recording at ambient temperature and pressure, converted into the equivalent pressure at 20 °C, the equivalent pressure value is the value of locking the SF6 density relay.

Check over-pressure value:

For SF6 density relay uniform slow inflation, when the SF6 density relay issue over-pressure signal recording at ambient temperature, pressure, and converted into the equivalent pressure at 20 °C, the equivalent pressure value is the over-pressure value for SF6 density relay.

I. Instrument overview

HTMD-H SF6 Density Relay Tester is intelligent, automatic SF6 density relay calibrating instrument . The instrument adopts single cycle instruction microprocessor-based technology, the running speed is 10 times than the ordinary single chip, can carry out on-site calibrating on SF6 density relay contact output pointer type and intelligent type current output, using interrupt mode for real-time capture of the density relay action, so the instrument to measure accurately and timely. This instrument is a portable testing instrument SF6 gas arbitrary environmental temperature pressure standard conversion, it can automatically check the SF6 density meter, pressure meter.

In a closed container, certain temperatures of SF6 gas pressure can represent SF6 gas density. Generally take the 20 °C SF6 gas pressure as the standard value. In the field of verification, in different environment temperature, measured pressure value will be converted into the corresponding 20 °C pressure value, used to judge the performance of SF6 density relay.

HTMD-H is automatically finished check process, convenient operation

and accurate measurement, simple operation menu.



II. Functions characteristics

1. Relay calibrator using analog digital hybrid single cycle high speed micro-controller as the core, the resources are rich and powerful, strong ability of data processing, because of its A/D, D/A, reference voltage, analog amplifier integrated in the MCU internal, so simple external circuit, good stability, high accuracy.

2. Instrument can be used for automatic verification of pointer type and electronic density relay.

Density relay 1 ~ 3 group of initial state for any form of contact (normally closed or open), can simultaneously measure 1 ~ 3 group contact response value and recovery value, so the instrument can meet the automatic calibration density relay, the old form of all.

3. Instrument using 320*240 color LCD, English operation interface, easy to use.

4. When measuring instrument and display the current pressure, the pressure corresponding to 20 °C, environment temperature. To solve the problem of SF6 density relay on-site check.

5. Test process is automatic, avoid the error caused by human factors.

Instrument can store 100 sets of measurements data and permanent preservation not lost, so that every measurement has trace ability.

6. Instruments through the RS-232 interface test data will be uploaded to

the PC machine, automatic generation of test data.

7. Instruments can check the atmospheric pressure and density meter in any environment temperature.

8. All the imported fast joints are used in the instrument pipeline. The connection is convenient and the air leakage rate is small.

9. The instrument has the clock function, and can be corrected at any time.

10. The instrument has the function of self - correction. When the instrument is used for a long time, can be calibrated and corrected to ensure the accuracy of the instrument.

11. Instrument adopts high precision pressure sensor and the world advanced magnetic fluid technology products.

12. The instrument is equipped with a variety of switch over joint, and most of the switches can be checked without disassembly.

13. The use of high capacity built-in battery, screen display battery power, expand the use of the instrument space, convenient field calibration.

III. Main technical parameters

1. Measuring accuracy: 0.25
2. Display mode: color LCD
3. Measuring range: 0 ~ 1.000Mpa
4. Pressure display resolution: 0.001 Mpa
5. Temperature: -20 ~ +60 °C
6. Storage capacity: 100group
7. Communication interface: RS-232
8. Print mode: desktop micro printer (optional)
9. Measuring range: -20 ~ 60 °C resolution of 0.1 °C
10. Power: AC220V $\pm$ 10% 50Hz DC12V
11. The weight of the instrument: host 3.0Kg
12. Host dimensions: 360*240*110mm

13. Case dimensions: 430*310*160mm

IV. The connection of calibrator and density relay

1. Confirm the density relay control power supply has been disconnected, ensure the density relay can be checked without external power supply.

2. Connect the signal line of instrument and calibrated meter.

2.1 Atresia, alarm, over-pressure output connect with calibrator.

The calibrator seven core plug green, red, yellow three alligator clip connected with the detected density meter contact 1, contact 2, contact 3, corresponding to the output end is connected (if without the output do not use), another terminal three 'Black' crocodile clips connected with the detected density meter contact 1, contact 2, contact 3, corresponding to the output end is connected (if without the output do not use).

2.2 The density relay 4 ~ 20mA output is connected with the calibrator

The calibrator four core plug 4 ~ 20mA input signal Red clip connect with the measured density meter 4 ~ 20mA corresponding output positive end (if without the output do not use), the black clip connect with the measured density meter 4 ~ 20mA corresponding output negative terminal (if without the output do not use).

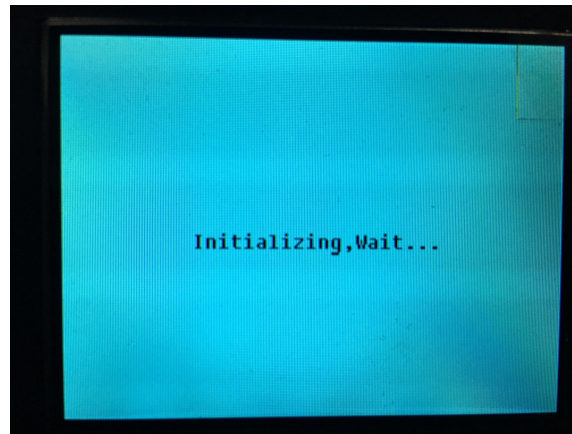
2.3 Ambient temperature sensor is connected with the calibrator

The three core plug binding with the test gas path insert 'SF6 temperature' socket of the instrument.

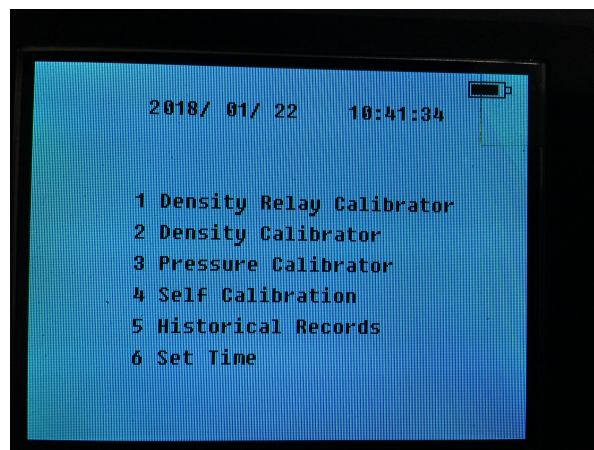
3. The gas path equipped with the instrument is connected to the cylinder and the inlet port of the instrument first. Then the calibrated SF6 density relay is connected to the instrument right 'test port'.

V. Operation and use

1. Check to make sure that each part is connected correctly turn on the instrument power enter the following initialization interface.

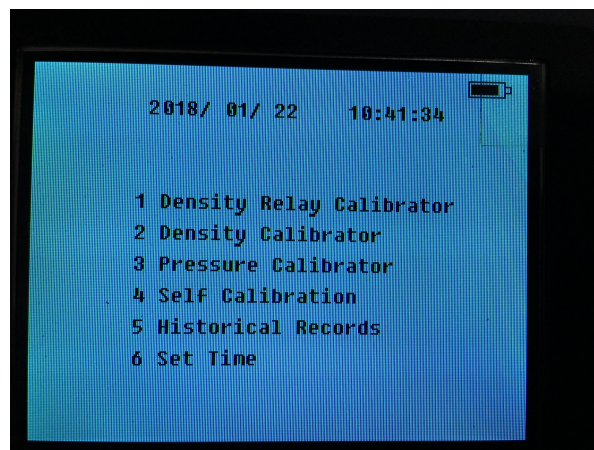


After about 20 seconds of delay, enter the next menu



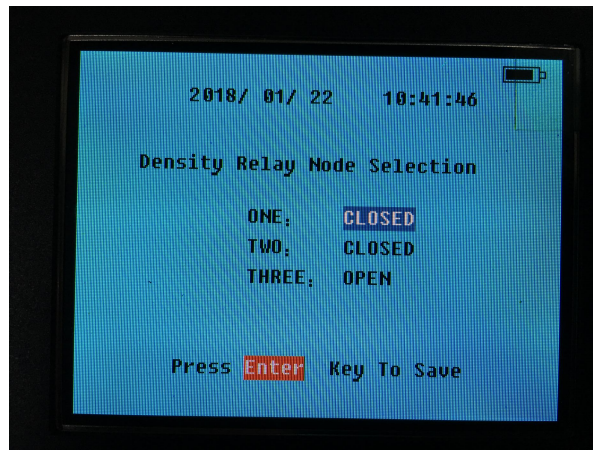
Press the "ENTER" key to enter the function selection menu, and other keys to enter the device and the calibrator number setting menu.

2. Function selection interface



Press the   corresponding menu button to select functions

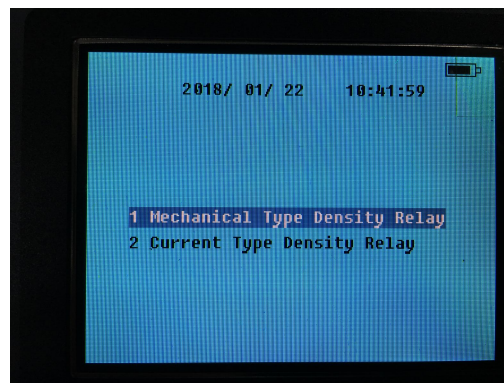
3. Density relay node selection



Press the $\Rightarrow \Leftarrow$ corresponding menu button to change mode, press "ENTER" button to save all changes.

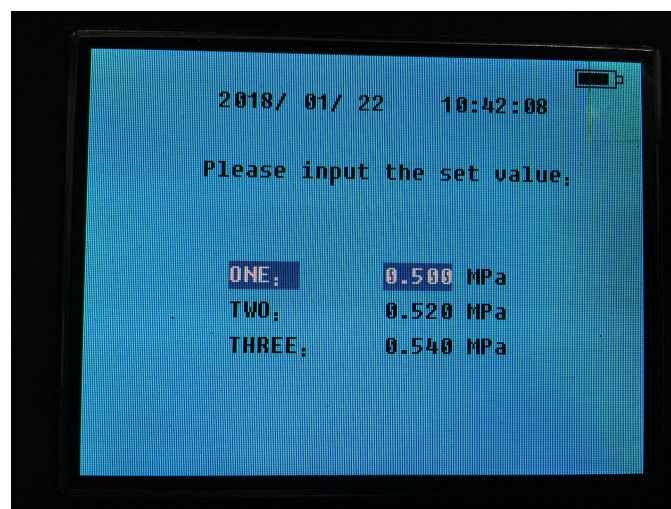
4. Density relay calibration interface

4.1 Density relay selection interface

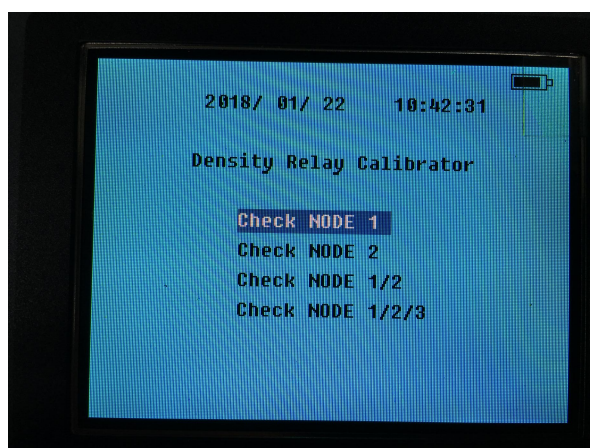


4.2 The value setting interface

Press the $\Uparrow \Downarrow$ skip, and press "ENTER" button to corresponding selected functions.

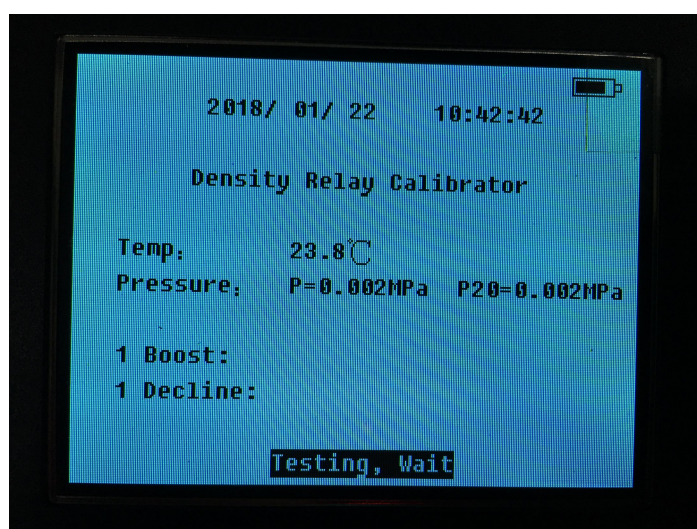


4.3 Density relay calibration interface

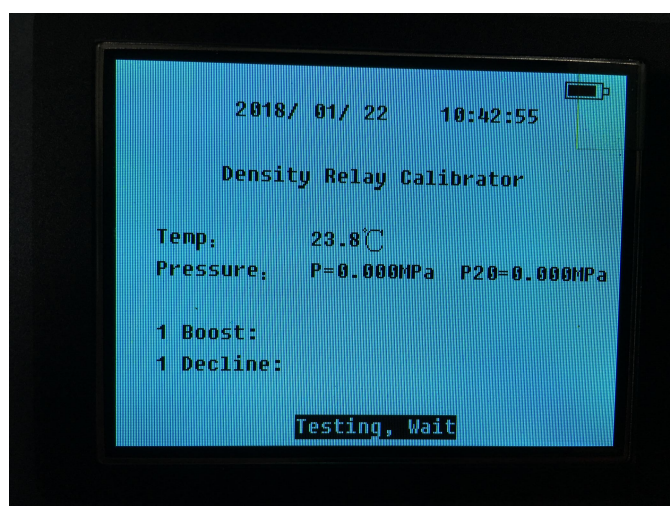


5. Density relay, filling gas calibration measurement interface

5.1 Contact 1 boost and decline calibrate

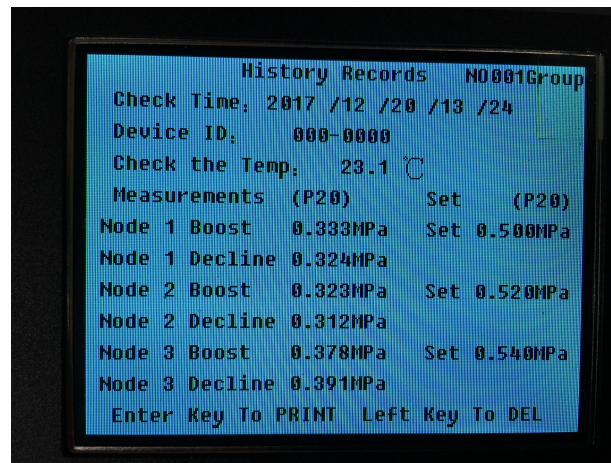


5.2 Contact 2 boost and decline calibrate



6. Instrument self calibration interface (only for factory use)

7. The historical records interface



8. Set time interface



9. Use method of gas cylinder:

9.1 Before testing, check if there was gas in the cylinder first, close the gas valve, open the master valve, pressure gauge indication value is the pressure in the bottle, the bottle (for example, air pressure is lower than the measured pressure value plus 0.9MPa, need fill gas before use, the charging tube pressure not more than 2.5MPa when filling gas .

9.2 After preparation, the pipe of the instrument is connected with the cylinder, and the master valve and the out-gassing valve are opened in turn.

9.3 Gas charging method:

The gas cylinder is inflated with an equipped inflatable connection device.

9.3.1 Close the out-gassing valve and the master valve. The pneumatic connection device is connected with the gas cylinder, and the other end is connected with the gas source. The valve of the gas source and the master valve of the gas cylinder are sequentially opened to observe whether the pressure gauge on the cylinder is rising slowly.

9.3.2. After gas filled, turn off the master valve of the gas cylinder, the valve of the gas source in turn, close the cylinder inflator and tighten it.

VI. Note

1. Before use, should check whether the power supply under-voltage, if under-voltage should be timely charging. Through the power on the instrument panel of 'power' 'charging' instructions exhibit of lanterns lit, after the battery is fully charge indicator lamp goes off.

Connect or disconnect the charger should first turn off the power , or may damage the instrument!!

If with printer please don't print when charging, in order to avoid over-load damage to power load.

Long-term when not in use for 2-3 months should charge and discharge time, to extend the battery life.

2. Be confirmed before the calibrated meter without power in connection.

3. The instruments are precision instruments, in use, the transport process should avoid strong vibration.

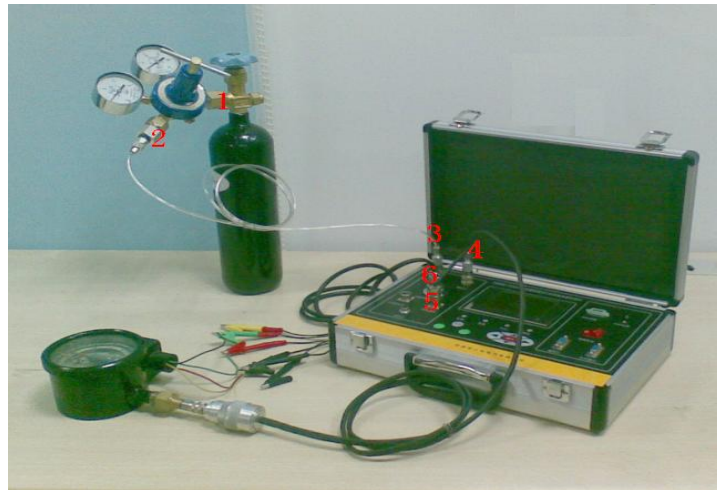
4. The instrument self checking function is only for factory use.

5. It is strictly prohibited to use the gas source with impurities, and the test pipeline is strictly forbidden to enter the oil pollution.

6. The pressure of the portable SF6 gas cylinder is not more than 2.5MPa when gas filling.

VII. Operations Guide

1. Connect vent line.



(1) Valve connection cylinder



(2) The intake pipe pressure reducing valve



(3) The intake pipe connecting instrument air inlet



(4) Test pipes connected instrument test port



(The fast interface, insertion force, remove the light according to the instrument air inlet.)

(5) The crocodile clip interface connection



(Note the bayonet)

2. Test operation

In the correct "connect vent line" is the basis for the test.

(1) Connect instrument



Connect the test instrument suitable joint, judge instrument electric shock, connecting the crocodile clip, clip in order to see appendix.

(2) Ventilation

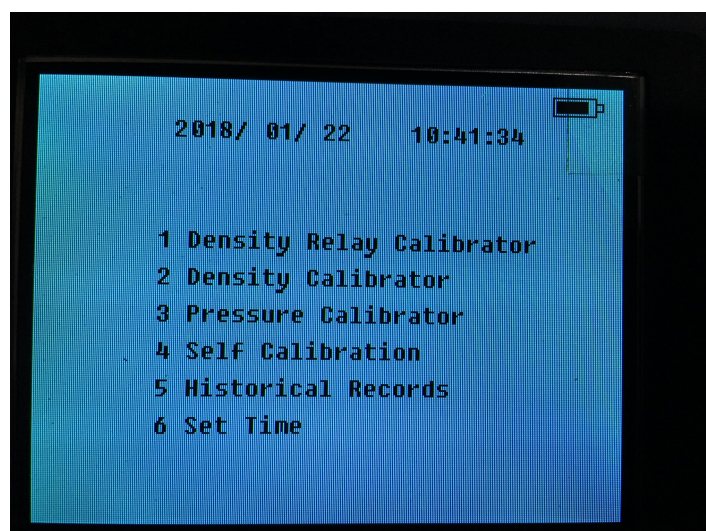


Open the outlet valve cylinder



Open the valve, the outlet pressure is about 1MPa

(3) Test



Appendix 1

Cylinder gas operation



1. Orderly connected interface 2 interface interface, 4, 5, the pipeline seal;
2. To open the valve 6, valve 1;
3. To open the valve of the cylinder 3, inflation, inflation pressure is about 1.5Mpa, (not more than 2. 5Mpa);
4. Inflatable after turn off valve 6, valve 1, pressure reducing valve 3;
5. Successively removing interface 5 interface interface, 4, 2;