

SA - 3089

Silica Analyzer



EPCC / PRODUCTS / APPLICATION / SOFTWARE / ACCESSORIES / CONSUMABLES / SERVICES

Analytical Technologies Limited

An ISO 9001 Certified Company

www.analyticalgroup.net

►► Summary

This online silicate measuring analyzer, it has the auto complete chemical reaction, photoelectric detection, display, transmission output and data storage function, the on-line automatic instrument of high precision; the instrument adopts the unique air mixing and photoelectric detection technology, which has the chemical reaction speed and high measuring accuracy and excellent characteristics; the instrument adopts color liquid crystal display, with rich colors, text, charts and curves, display of measurement results, system information and the Chinese menu operation interface; combined with the humanized design concept and high new technology, highlighting the advantages of the instrument and competitive products.

►► Product features

- a. the examination inferior limit is low, suit the Huo contents of power station water supply, saturated steam and superheated steam very much examination and control;
- b. the online silicate measuring instrument use monochromatic cool light source table, the light source service life is long;
- c. the instrument has the history song wire recording function, can store a data for 30 day;
- d. the instrument have an automatic mark settle function, the cycle arbitrarily sets;(this function need to explain while ordering)
- e. favor the measurement of much road water kind;(can choose 1-6 roads)
- f. the instrument the addition tries an agent and marks kind, besides which, have no operation capacity, truely come to a to don't need a maintenance.

►► Technical parameters

- a. Measuring range: The 0~20 ug/L, 0~100 ug/L,0-5000ug/L,0-100mg/L can choose
- b. Accuracy:±1%F.S
- c. Repeatability:±1%F.S
- d. Stability:≤±1% F.S / 24 h
- e. Response time:About 12minutes
- f. Message Cycle:10minutes / channel
- g. Sample condition:flow:>100 ml / min
temperature:10~45°C
pressure:10 kPa ~ 100 kPa

- h. Environment requests: temperature :5~45°C
humidity:<85% RH
- i. Chemicals Dosage:3 kinds 3L/kind/month
- j. Current Output:4~20mA or 0~10mA can choose
- k. Alarm Output:Relay(220V/1A)
- l. Power supply:AC220V±10% 50HZ
- m. Power Dissipation: ≈50VA
- n. Outline Size:720mm(h)×460mm(w)×300mm(d)
- o. Install Size::665mm×405mm

►► Instrument structure and operate principle

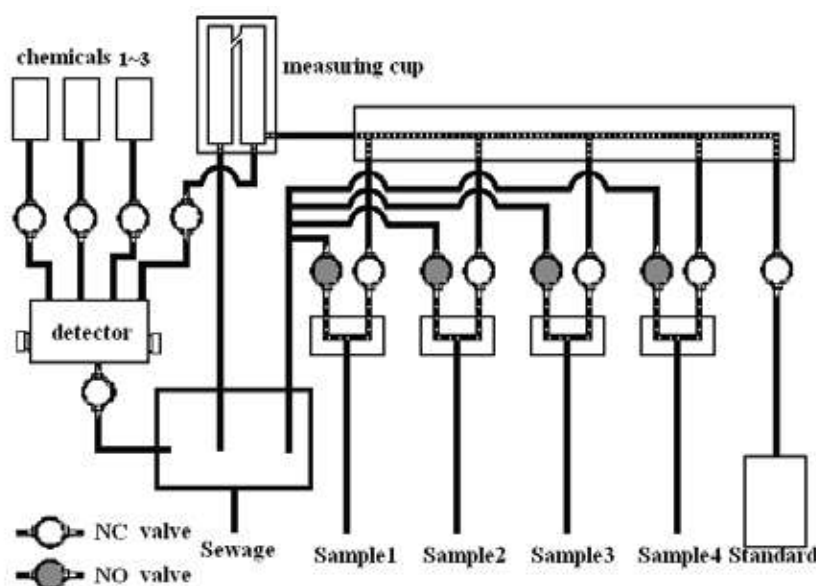
a. Chemistry principle

Under the certain acidity condition, Silicate and molybdate reaction of silicon molybdenum yellow, Then the reductant into silicon molybdenum blue, then determined by spectrophotometric method. Phosphate under these conditions also have similar reaction, can cause interference to measurement by interference, adding oxalic acid phosphate.

The color product absorption maximum at about 810nm, the selection of instruments were measured 810nm refrigeration source.

b. Analysis of flow path

The measurement adopts quantitative sampling, color reaction, colorimetric analysis, flow path as shown below.

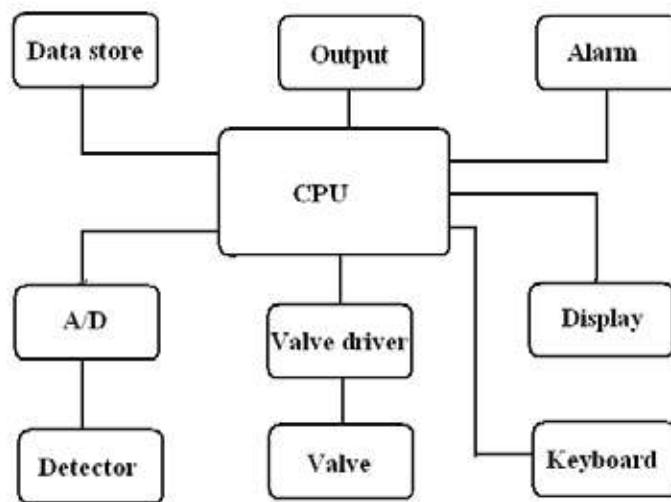


4 channel silicate measuring instrument flow diagram

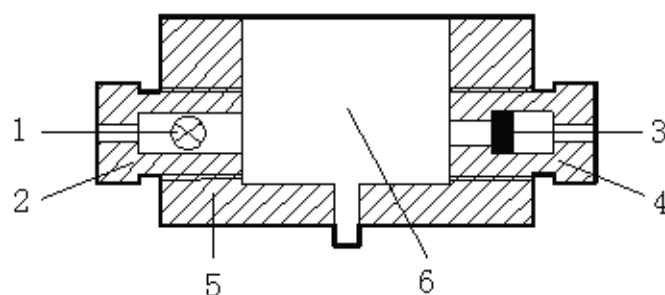
c. Electricity principle

Electrical system equipment mainly consists of two parts.

Test drive: drive each executive component instrumentation system (solenoid valve, air pump) and the light source; and the voltage signal of the photocell detector in digital processing, realized the function of automatic action and electric signal to light to electricity conversion, digital signal process and. This part is composed of detector, A/D MCU circuit board, electromagnetic valve and air pump.



The Electronic works priniple



- | | | |
|---------------|-------------------|---------------|
| 1. Light | 2. Light shell | 3. Solar cell |
| 4. Cell shell | 5. Detector shell | 6. Detector |

►► Display and output fraction

Vs the data progress for examining storage and display; Combine to output switch (report to the police output all the way) and simulation (six road currents output a 0~20 mas) semaphore, be applicable to control various automation equipment; Can pass keyboard to mark to settle an instrument and testing instrument and search history to measure a data. This fraction constitutes to° from the display, keyboard, host (CPU) and output mold mass.

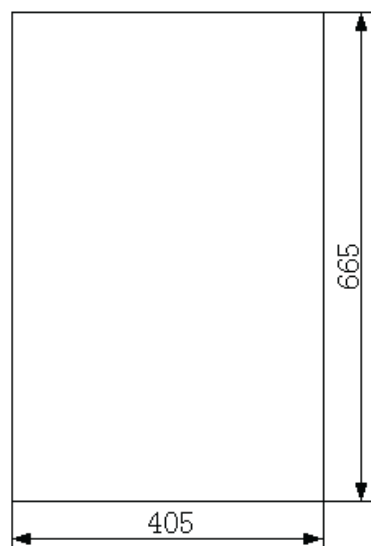
►► The instrument installs

a. the setup request and regulation:

1. Analytical instrument setup the location close to sample to click possibly, water kind taken should have to represent ;
2. Being measured water kind and environment temperature should otherwise will effect chemical analysis process between 5~45 °C and effect to measure accuracy thus;
3. Assure water kind has no impurity and filth, because of overhaul when the reason make fluid matter unqualified, should break boiled water kind, the instrument breakup circulates;
4. The working condition surround that installs an instrument should not have strong electromagnetic field and strong vibrating source;
5. The instrument wants to install at the drying have no dust, have no the environment of causticity gas amid;

b. Fixed method:

The instrument can install on various meter pan or the stationary packing block, at with dial setup, press chart to open hole, open hole size for; (665 × 405 mms)



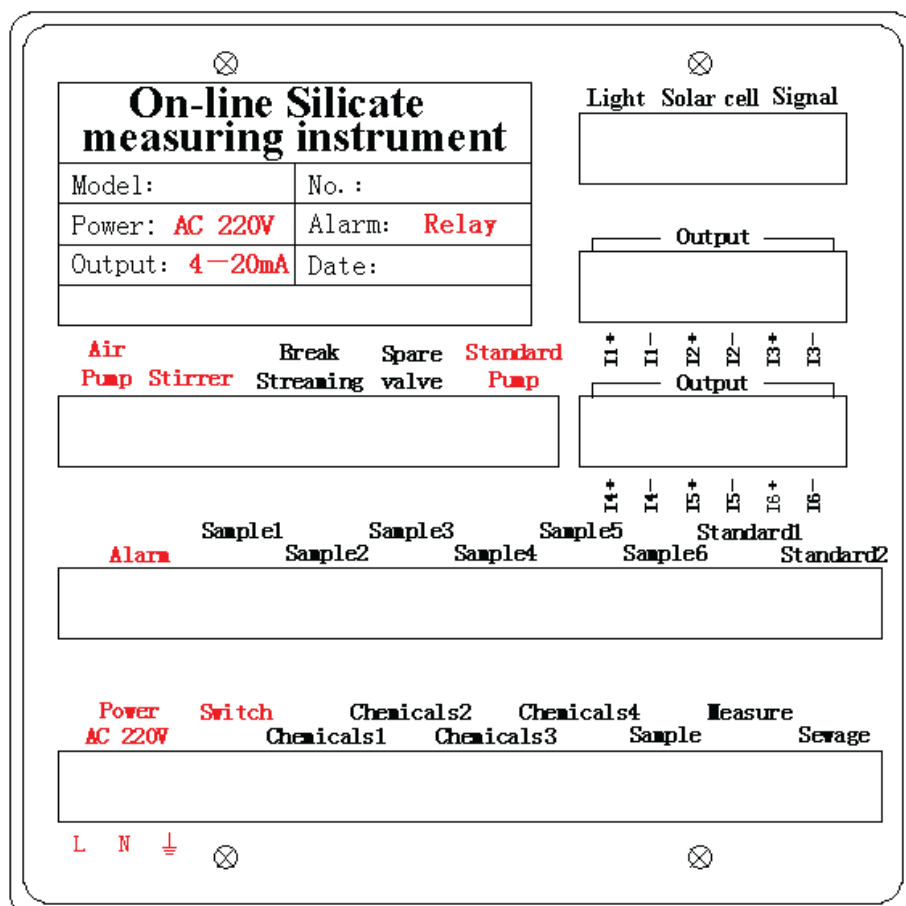
c. Sampling piping and row discard the connectivity of piping:

Instrument water kind connecting orifice is a $\Phi 6$ card modes deal with contact, can link $\Phi 6$ rust proof steel pipes or use to link a plastics hose after transferring the prinipal; Line up the waste water tube provides and discards an orifice with instrument lower part row it to put connecting with the instrument and after fixing, directly connectivity at row discard piping top then. Noting can not squeeze or curved fold, assure to drain smoothly.

Note: The instrument tries agent and mark kind feed and adopts a barometric mode and circulate each barrel and its piping that try a barrel and mark kind all have certain press, therefore as to it's the piping connecting orifice section need particularly note, assure a connectivity firm, seal completely good, and need regular audit, discover damaged part in advance and avoid resulting in and try agent or mark kind leakage.

d. Instrument power supply

1. Instrument have to dependable resistance of connecting ground is in response to less than 0.4Ω ;
2. Communicate to input the voltage as AC220 V $\pm 10\%$ 50 Hzs, power cord the body bottom wear wire hole to wear to go into from the instrument box and link in a - c source terminal; The front line connects L, the null wire connects N, and the ground wire connects on the gnd to mark location.
3. Wiring location the following chart;



►► Preparing of chemicals and standards

a. Prepare chemicals

- i. Trying the agent has to adopt to have no silicate water to prepare to assure the instrument measurement of accuracy, the chemicals needed(analytical pure):



ii. Prepare method:

1. Chemical 0(R0):

Take 84ml 98% H_2SO_4 ,slow-moving to pour into 800ml pure water,Cool off indoor temperature ,then fill to 1 L with pure water

2. Chemical 1 (R1):

Take 80g $(\text{NH}_4)_6 \text{Mo}_7\text{O}_{24} \cdot 4\text{H}_2\text{O}$,Dissolve into 800ml pure water,then fill to 1 L .

3. Chemical 2 (R 2):

Take 80g $\text{C}_2\text{H}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$,Dissolve into 800ml pure water,then fill to 1L,move into the bottle of R2

4. Chemical 3 (R 3):

Take 12ml 98% H_2SO_4 ,slow-moving to pour into 800ml pure water,Cool off indoor temperature then take 12g $\text{Fe}(\text{NH}_4)_2 \cdot (\text{SO}_4)_2 \cdot 6\text{H}_2\text{O}$,Dissolve into these water,then fill to 1L,and move into the bottle of R3.

5. Mixs R0 and R1 at 1:1 ,then move into the bottle of R1 when use.

b. Prepare standard:

The standard liquid has to adopt to have no silicate water to prepare, the chemicals used for:(analytical pure)



1. 1000mg/ L SiO_2 Standard:

The accuracy calls to take Na_2SiF_6 3.130 g or $\text{Na}_2\text{SiO}_3 \cdot 9 \text{H}_2\text{O}$ 4.730 g.

Be dissolved to a little amount have no silicate water amid, then fill to 1 L.

2.100mg/ L SiO_2 Standard:

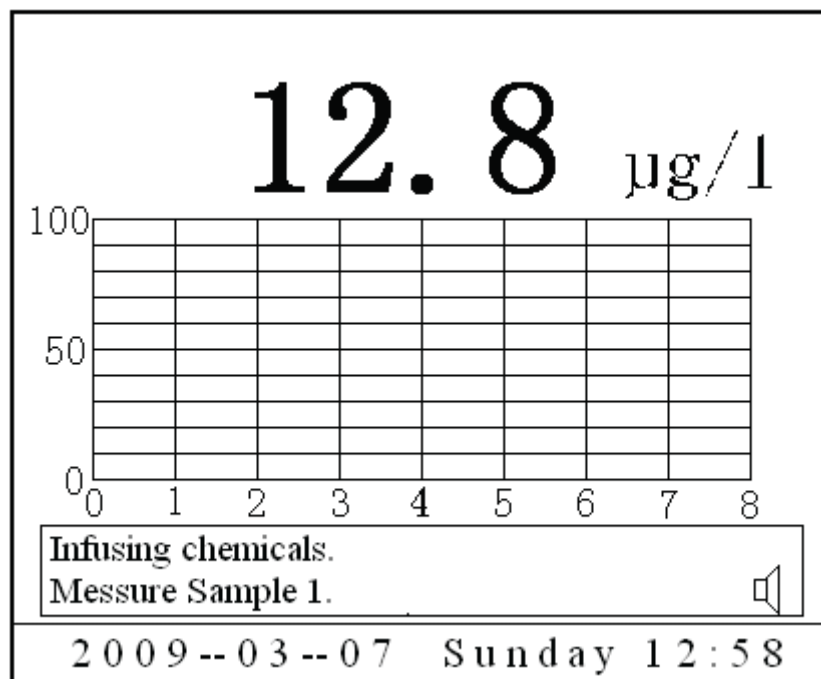
Take some 1000mg/L SiO_2 standard,dilution to 1000% with pure water.

3. prepare the standard1 and standard2 whith 100mg/ L SiO_2 Standard and pure water.

►► The instrument operates

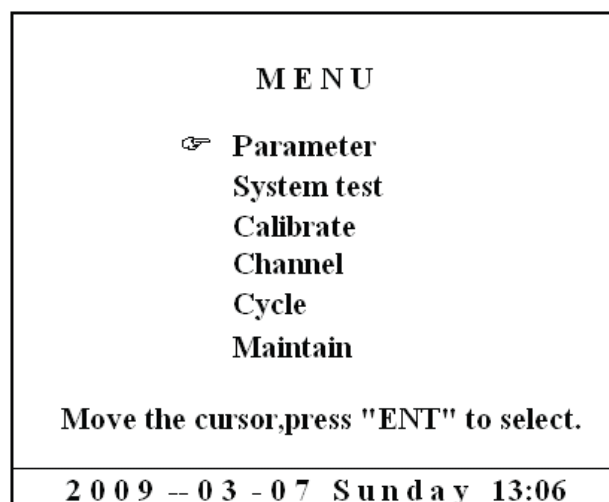
a. Power on

Check each parts of instrument first before booting, validation without any error after, the accurate building - out tries agent and mark kind, the switch on instrument power supply, and place instrument power switch the location is at "ON", at this time instrument up electricity, after needing the calculator system completion beginning to start to turn process, the instrument enters a regular work status and runs as follow an interface:




b. Main menu

Presses the  key after booting and enters a main course unipole; The instrument displays at this time:







Press  key or  key, can up and down move cursor to select a submenu, press the  key, enter a submenu.

c. The parameter establishes



S E T U P			
	Iout1	2 0 . 5 1 mA	Stand1 1 0 0 . 0 ug/l
	Iout2	2 0 . 4 8 mA	Stand2 2 0 0 . 0 ug/l
	Iout3	2 0 . 4 5 mA	K = 0 . 1 6
	Iout4	2 0 . 5 0 mA	B = 0 . 5 0
	Iout5	2 0 . 4 0 mA	AlarmL 0 . 0 0 ug /l
	Iout6	2 0 . 4 6 mA	AlarmH 1 0 0 . 0 ug/l
	Izero	4 . 0 0 mA	Range 2 0 0 . 0 ug/l
	Ifull	2 0 . 0 0 mA	I-temp 4 . 0 0 mA
	Date	2 0 0 9 -- 0 3 -- 0 7	
	Time	1 3 : 0 6	Week 7
Move the cursor,press "ENT" to select.			
2 0 0 9 -- 0 3 - 0 7 S u n d a y 13:06			

In "systems test" display interface, can "open" vs each execution parts and semaphore output progress of instrument system with the test of "pass", use to testing each parts can regular work, output whether the semaphore is accurate, particularly vs system chemistry streaming road of the maintenance has an important action. "Open" by light source and "close" to come now as to it's the operation interface take into to explain:

Display an interface in "systems test" amid, press  key or  key, move the cursor to "light source" item, make character list "pass" for anti white suggest and press the  key at this time, character list from "pass" change into to "open", at the same time the light source of the detector operate, can observe the orchid color of the delivery of light source it is thus clear that optics; This means light source operate normal, and according to the performance that the flaring intensity can judge light source; Press the  key again at this time, character list will from "open" to change into a "pass", at the same time the light source lay - off of detector.




All tests press  key after ending, can make instrument return a normal measurement operate status.


e. The instrument calibrates

Display an interface in "main course unipole" amid, press key or  key, move the cursor to "calibrates" item, press the  key, enter "calibrates" operation interface.




Calibrate							
☞ Test standard					ug/l		
Calibrate Normally							
Calibrate Quickly							
R E S U L T		1	2	3	4	5	A.
	Nor.	16.36	16.40	16.38	16.44	16.48	16.38
	Qui.	16.46	16.45	16.43			16.45
	K=	0.16					
	Time: 2 0 0 9 - 0 3 - 0 4 14:00						
Move the cursor,press "ENT" to select.							
2 0 0 9 -- 0 3 -- 0 7 Sunday 15:26							


After entering "calibrates" display interface, can carry on mark to settle an operation vs the instrument, its operation can screen indicate that prompt progress, the process is as follows:

Display an interface in "calibrates" amid, press  key or  key, use up the mark select "Calibrate Normally" or "Calibrate Quickly", press the  key, the instrument enters at this time vs mark kind of automatic measurement operate status, Will automatically computing measure after completing five (is rapid calibration for three times) samples in the instrument a measurement as a result, beg average value, and computing a gradient (S) of measurement to be worth, will calibration result and calibration time keep together, completion calibration process.


Instrument calibration end, press the  key, the instrument return measures a status as usual; If adoption of is Calibrate Quickly, the instrument after calibrating the completion automatically returns normal measure status.

f. The instrument is many gateway uses but designs, but sometimes the consumer don't need to use all gateways, can select at this time feeling close among them a few some gateways, the operation method is as follows.

Display an interface in "main course unipole" amid, press  key or  key, move the cursor to "gateway select" item , press the  key, enter "gateway select" operation interface.


CHANNEL	
 Sample - 1	✓
Sample - 2	×
Sample - 3	×
Sample - 4	×
Sample - 5	×
Sample - 6	×

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Press  key or  key select channel, press the  key to open or lock some gateway. The gateway being picked out will display V, the gateway of the close display X

Press the  key conservancy setup, return to measure status.





g. The data searches

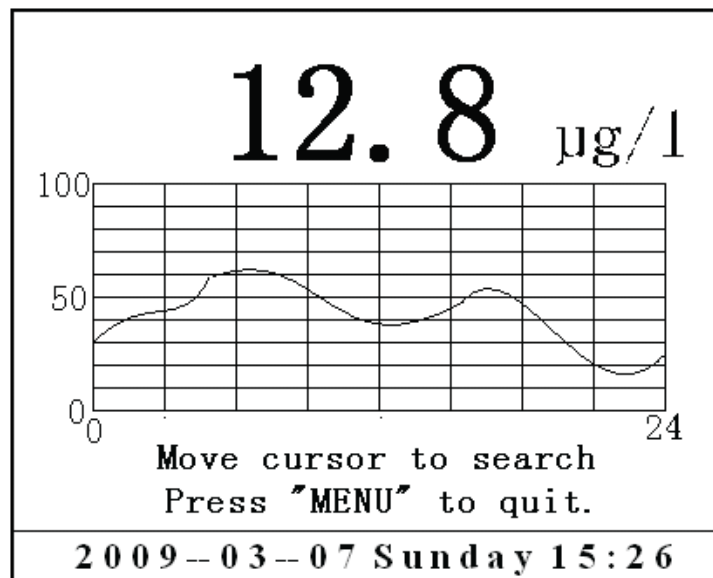
In the instrument regular work under the status, press the  key, enter time of "data search" to establish to display an interface:



SEARCH									
<table border="1" style="width: 100%; text-align: center;"> <tr> <td>M</td> <td>D</td> <td>H</td> <td></td> </tr> <tr> <td>03</td> <td>06</td> <td>12</td> <td>CH 01</td> </tr> </table>		M	D	H		03	06	12	CH 01
M	D	H							
03	06	12	CH 01						

2009--03--07 Sunday 15:26

Can screen indicate at this time that of prompt, carry on a month, day, of setup operation, it operates process as follows:

Press the  key, move a cursor, select a month, day, etc. item, make its figure present anti white display, press  key or  key, tune figure, establish want to search of time, press the  key, enter "data search" display interface:



Display one measurement curve of 24 hours time segment of holding at this time, press the  key or  key, move a cursor select for concrete time, is then suggested by the figure of screen, read the then measured value.

►► The instrument supports

- a. The instrument carries on the following inspection and operation to the system before throwing in run - time each time:
 1. Checking the parts of gnds of electricities whether is good, each terminal tie line had no loose, shed off;
 2. The inspection tries each connectivity parts of agent, water kind streaming road to have have no corrosion and seep into;
 3. Enter "systems test" status, carry on an inspection test to instrument system each parts;
 4. Has been checked above, confirm system without any error or through overhaul, after expeling all faults, accurate the building - out try agent and standard liquid, the switch on water kind, try instrument invest run - time.
- b. the instrument carry on the following maintenance and operation to the system after throwing in run - time:
 1. The periodical addition chemicals;
 2. Assure water kind continuously flows, otherwise the instrument can not be accurate to measure;
 3. Terminal or irregular dates vs the instrument carry on mark settle, if in the instrument system "parameter setup", establish auto mark in fixed time cycle, the instrument will press the automatic completion mark to settle an operation. (Because the instrument auto marks in fixed time incapability vs mark the kind status carry on criterion, so have to assure two kinds of marks sample guildler firm, the amount of medicine is ample. The in bar of bug mark fixes photographic film and rings instrument run - time, plant this function have already been locked, if need and use this function, can contact the plant house, the CPU mold mass that make gratis providing and include this function in the plant house)
- c. the instrument breakup carry on to clean an operation to the system after circulating: The chemistry adopted by instrument tries an agent and has stronger causticity, so when the instrument stops a luck, try a streaming road to carry on cleaning to the instrument.

Dismantle each a barrel of trying first, print with the clear water, then join clear water, the switch on instrument system power supply, and enter "systems test" status; Open "the row discards" electromagnetism valve first, then one by one in order open each one to try a control electromagnetism valve (don't open several electromagnetism valves at the same time), until the vestigital in the streaming road tries an agent to completely flush, again exit an instrument "systems test" status, lock instrument power supply.

The instrument cannot also enter main course while stopping a luck unipole, select "halt upkeep" function, then press the instrument prompt good clear water of connecting, the instrument cannot automatically complete to clean process, finally according to hinting to lock power supply then.

Note A: Between different batches of the instrument may be slightly different, with instruments with instructions shall prevail.

Note B: Instrument Reagent and sample delivery by air pressure, running the reagent containers, standard pressure barrel and pipeline are, therefore need regular check, found damaged parts in advance, avoid reagent and sample leakage.

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