

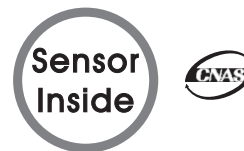
## CONTINUATION

Dear user,  
Description in the manual is based on newest products.owing to improvement or other changes, contents of manual may differ from practical situation. our company will reserve the right of recension at any moment,please kindly forgive not to notify the revised place one by one.

## GY-4 USER' S MANUAL

GY-4 Series  
User Manual

DIGITAL FRUIT SCLEROMETER





We are pleased for your patronage of purchasing GY-4 series digital fruit sclerometer.

This sclerometer is small and handy to test the maturity of fruit , please read the manual carefully before use, in order to take full advantage of all function, to get correct test value during test.

## CONTENT


Caution.....	2
Fuction.....	3
Characteristics.....	3
Parameters.....	4
Dimension.....	5
Test stand (be choosed).....	6
Name and function of parts.....	7
Prepare operation.....	11
Test.....	11
About Memory,Deposited Value,Small adopting Value.....	13
Serial output and print.....	14
Charging battery.....	17
Packing List.....	18

## Packing List

Number	Name	Quantity
1	Body	1
2	Power adaptor	1
3	M3×8 screw	5
4	Test hand	2
5	Test accessories	1
6	Matching CD	1
7	Manual	1

- : Shutdown serial port to stop;
- ☞ : Collect the present data by hand;
- ⌚ : Continue collect data timed.

### Charging battery

This gauge use Ni-Hi batteries with 8.4V/1200mAh as power. the fully charged battery can work about 40 hours continuously.It can be used about 3 months in a state of power off. If Ni-Hi batteries power are low, “” will flicker on LCD. please charge battery by adapter DC12V/300mA and it will count the time of charging and stop charging after full, to keep the battery durable.

Attention:

- 1、Frequent charging and long time charging will shorten the life of battery;
- 2、Do as you can to charge battery as the electricity runs out, it can cancel remember effect;
- 3、It can test when charging;
- 4、Battery life: under normal using,charging/discharging about 300 times

### Maintenance

- 1、Clean dirt and dust from gauge with soft cloth.after dipping cloth in the detergent water and squeeze out water, then clean dirt with the cloth. do not use volatile chemical liquid to clean gauge,such as bezene,thinner,alcohol, etc;
- 2、Handle carefully when using and carrying;
- 3、Never disassemble, repair or remodel the gauge by yourself;
- 4、If malfunction, please contact original sale department or our company.

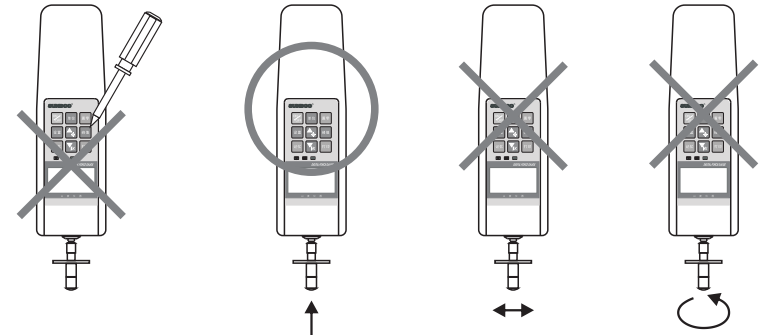
### Caution



If wrong operation,that may destroy the instrument or lead to grave accident.This manual teach you how to avoid accident happen and how to use this instrument. Please carefully read this manual before testing and save it. The accurate testing range is 10%--100%FS.



- 1、 Please wear protective mask to protect you from scattering pirces whice in testing.
- 2、 When screen show“Error”it means load on sensor is over rated load by 110%, reduce the load immediately. when power on, not load-on exceed rated load by 2%.



Picture 1

Picture 2

Picture 3

Picture 4

- 3、 Do not use cuspidal tool to press operating key (picture1) .
- 4、 This instrument is just applied to vertically test fruit hardness (picture2) . Do not give force to it when test stick is bend. (picture3、 4) .
- 5、 Do not use overload, overload using、 overload shock and the load from directions (except the direction of push and pull) will damage sensor.
- 6、 Do not use damaged or deformed test head.
- 7、 Do not put this instrument in the place that water, oil or other liquid maybe splash on it.Please put it in shady, dry and stable place.
- 8、 Do not use other adapter which is not provided with the sclerometer. If other adapter be used, possible fault may be in the circuitry that may be cause fire.
- 9、 Insert AC adapter into receptacle socket and it should be snugly fitte loose

- fitting may cause electric shorted that may lead to electric shock or fire.
- 10、 Do not charge or operate the sclerometer in other voltage,which is not applied with it, may cause electric shock or fire.
- 11、 When your hand is wet, please do not plus or insert the adapter, to avoid electrical shock.

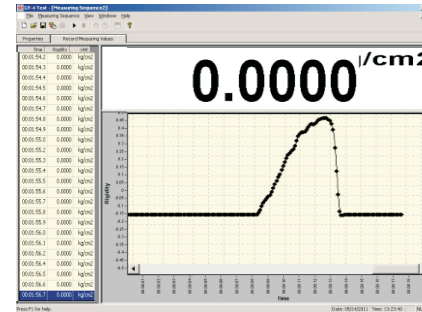
**Function**

GY-4 fruit hardness sclerometer is a new generation of common using and handy instrument designed by our company for testing maturity of fruit. Small, light, easy to carry, multi-function and high resolution,it is applied to test the hardness of apples,pears,potatos and so on.

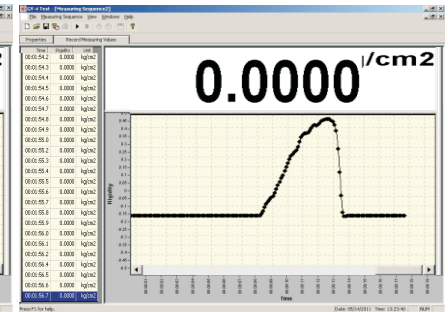
**Characteritics**

- 1、 High accuracy and high resolution;
- 2、 Settign upper and lower limit. The gauge will auto compare the sample. The sresult is indeicated by red, green lamp and alarm with buzzer;
- 3、 Indicate the direction of force;
- 4、 The blue background illumination can be choosed;
- 5、 Memory 10 testing data, and count the average automatically ;
- 6、 Two units Mpa,  $kg/cm^2$  and auto inter-convert ;
- 7、 Peak holding function,peak holding will be auto cancelled and the hold time; can be set from 1-10 seconds.
- 8、 Auto power off, and the time can be set by user;
- 9、 RS-232C output, connect to computer can realise curve testing, connect to micro-printer, can print 10groups deposited testing data report.

- G、 After set parameter, click on the option of record measurements, change into curve interface;
- H、 Click on, then press TIMER,start to adopt test data curve (picture16) ;
- I、 After test, press to stop (picture17) ;

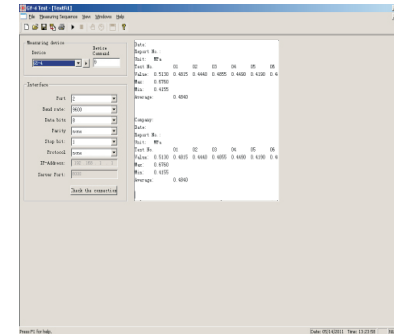


Picture16



Picture17

- J、 Click on saving option in the file to save data;
- K、 If select text file in dialog box, it is the derived saving data.Then select the model that corresponding to the instrument in device type, select the matching serial port for computer; click “▶”, open serial port, then press “PRINT”, the saving data will be imported to computer. (picture18)

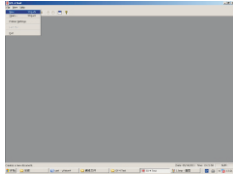


Picture18

Symbol illustration:

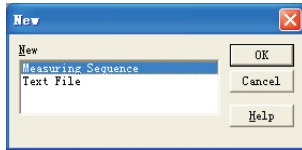
- : Import the adopting data into EXCEL;
- : Open serial port, start to test;

- B、 Power on, make the gauge be in working state, set serial output as “Pc” (details as “setting” part) ;
- C、 Put the accessory CD into CD driver, open serial software path: CD driver\Chinese\test software\GY-4 Test\GY-4 Test.exe;
- D、 Click new paper option (picture13) ;



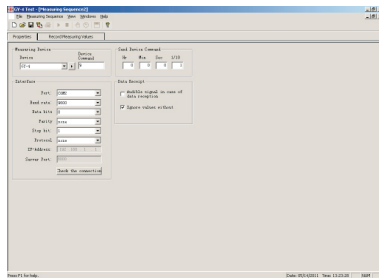
Picture13

- E、 The pop up dialogue box has to mode can afford you to choose: test curve file and text file (picture14) ;



Picture14

- F、 After choose test curve file, select the model which corresponding to the instrument in device type, select computer matched serial port, select 9600, select 8 as data bits, 1 as stop bits. last,in device send command, set the time of computer adopting testing data signal, 1/10 as 0.1sec(picture 15: hour as 0, minute as 0, second as 0, );

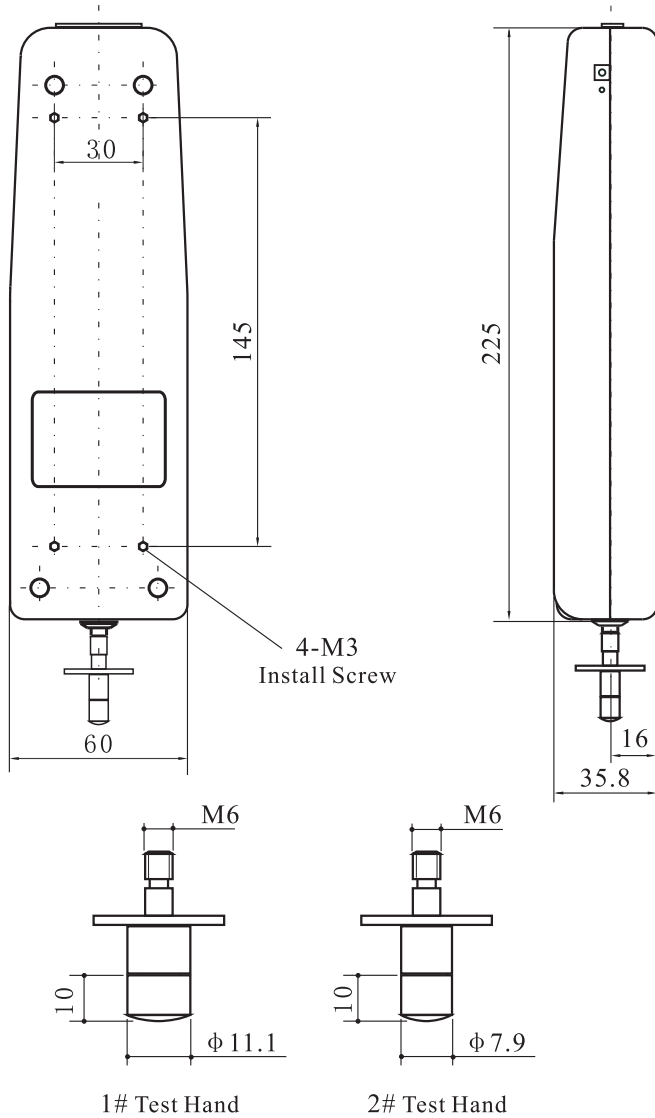


Picture15

## Parameter

Model	GY-4			
Camp Size	1# $\phi$ 11.1mm		2# $\phi$ 7.9mm	
Capacity	1MPa	10kg/cm <sup>2</sup>	2MPa	20kg/cm <sup>2</sup>
Resolution	0.0005 Mpa	0.005 kg/cm <sup>2</sup>	0.0005 Mpa	0.005 kg/cm <sup>2</sup>
Unit	Mpa、 Kg/cm <sup>2</sup>			
Inaccuracy	$\pm 1\%$			
Sensor conformation	Sensor Inside			
Power	Accessory power adaptor: DC 12V/300mA Charging battery inside: Ni-Hi8.4V 1200mAh			
Work temperature	20 $\pm$ 10 $^{\circ}$ C			
Carry temperature	-27 $^{\circ}$ C~+70 $^{\circ}$ C			
Relative humidity	15%~80%RH			
Work entironment	No shaking source and corrosive things around			

Dimension



Picture 5

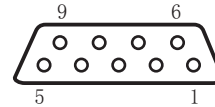
memory state.

Serial output and print

Serial output is RS-232C, is used to connect outer equipment like micro printer and computer, the matched micro printer must support RS-232C.

1、 When serial output mode set as Print , press “ **PRINT** ” , LCD show “Print” , instrument print 10 groups saved data and analysis report.

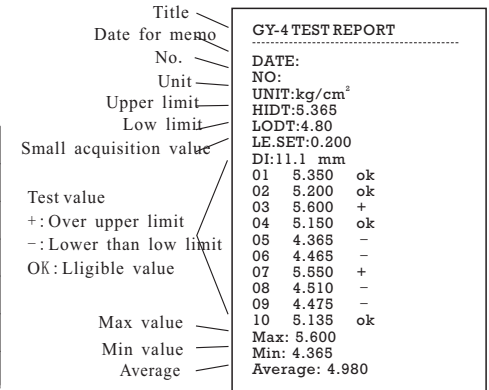
Serial needle illustration



Needle	Signal	Illustration
2	TxD	Output signal of scm
3	RxD	Incept signal of scm
5	GND	Earth
6	+2V	Over upper limit
7	+2V	Lower than low limit
8	+2V	OK is the eligible

Picture 11

Print paper illustration



Picture 12

2、 When serial output mode set as Pc, connect to computer could watch test curve by serial software or derive 10 groups saved data, the needed configuration and operation as follow:


- (1) Hardware enviroment
  - ①CPU: More than 1G ;
  - ②Internal storage: 256MB or over;
  - ③Capacity of HDD: 300MB or over;
  - ④CD driver: CD-ROM or DVD-ROM.

(2) Software enviroment  
 Operating system: Windows XP (32 figure)

(3) Specific operation  
 A、 Connect communication interface to computer with serial prolong cable;



## 6、 Test

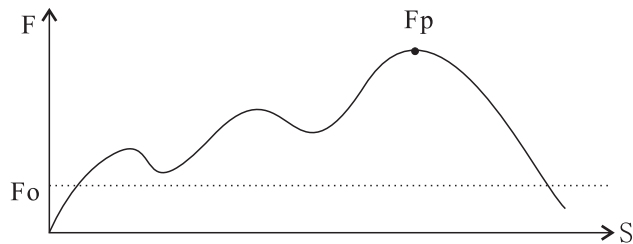
Check instrument whether in the condition of save value, if LCD show “AVERAGE” , press “

Right hand hold gauge tightly or install it on test stand, change test mode into peak holding mode, press the tip vertically into fruit by steady force, (10mm inside fruit) , now, the reading data is testing hardness.



When it finished, slowly remove load, shutdown, disassemble the tip, clean all the parts of instrument and put into the box carefully for next time to use.


## About Memory, Deposited Value, Small adopting Value

When using memory function, please according to hardness to choose proper min acquisition value of deposited “Fo” , when test value big than “Fo” memory function start to work to memry the biggest value, when value of hardness smaller than “Fo” , finish a test (picture10). the biggest value of this test “Fp” will be saved, the left of memory location in LCD show “√” , “▶” auto forward one case, waiting for next time memory test. when min acquisition value bigger than test value, memory function do not work.



Picture 10

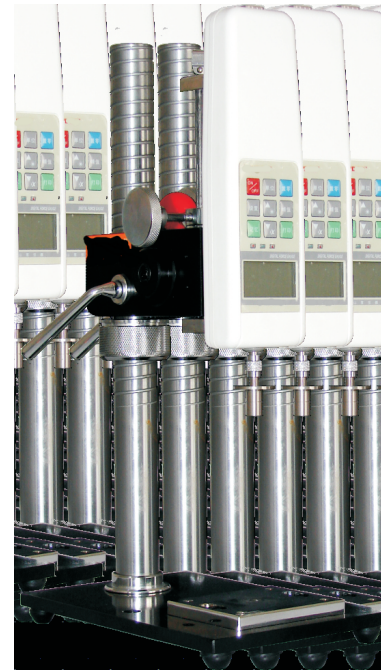
This instrument can deposite 10 testing value, when 11th test, the 1th deposited value will be substituted, press “

See the average of all saved data, press “

- 13 -

## Test stand (be choosed)

This series sclerometer can be matched with different test stands, and it will be more convenient、 stable 、 and accurate to test the hardness of apples、 pears、 potatos and so on.



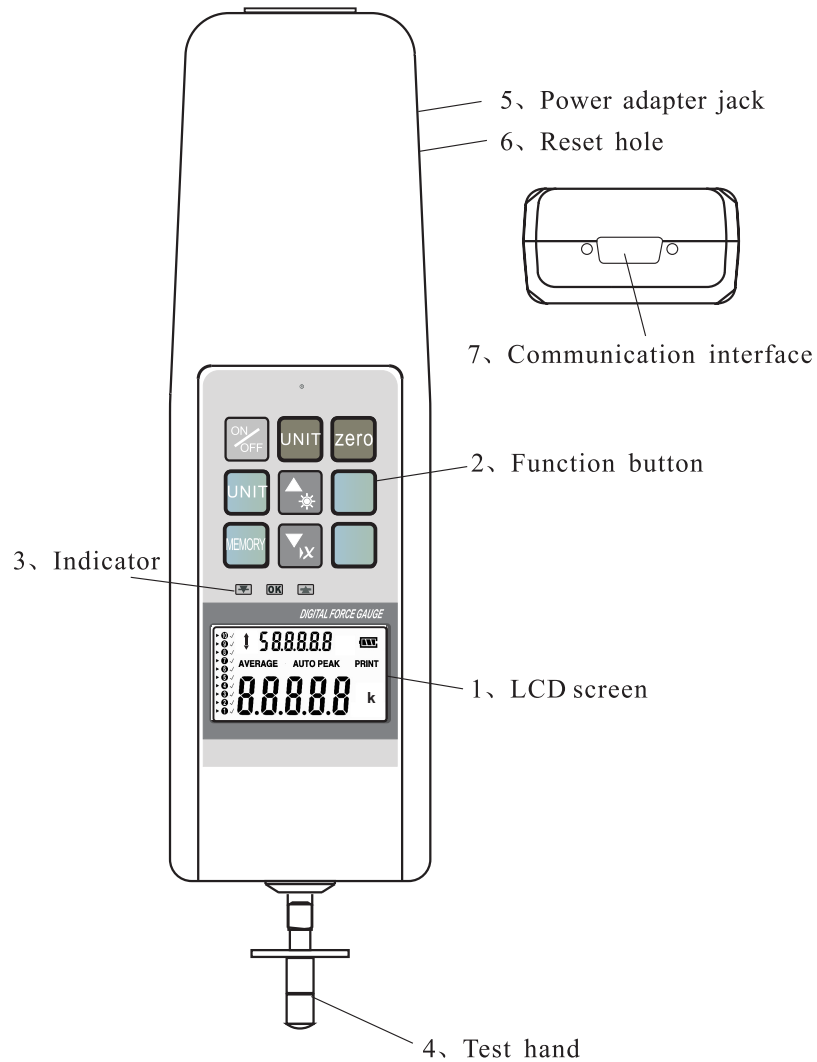
SPJ manual pressure test stand



SJY-500 electric test stand

Pictures 6

## Name and function of parts



Picture 7

Real time value of load / maintain peak/ peak maintain automatic lifting of state's three models to choose: after the start of default mode for real-- time tracking mode, there is no "ZERO" press "PEAK", LCD will display "PEAK", it is in maintain peak, equipment to read the numerical test is in process of testing under load to bear the greatest value. in maintain peak state, press "PEAK" can clean the value on LCD, it is peak maintain automatic lifting state, in this state the gauge automatically cleared after maintain peak setting time and wait for the next peak.

## 4、 Select suitable unit

There are two kind of unit: Mpa and kg/cm press "UNIT" to choose suitable unit. can change unit before or during testing.

5、 Upper and lower limit, min adopting value for deposit, auto power off time, peak hold and auto releasing time, serial out put mode and diameter of measuring tips:

1th, press "SET", LCD show "HidT", digital box show upper limit value press "▲\*▼" can change;

2th, press "SET", LCD show "LodT", digital box show lower limit value press "▲\*▼" can change it;

3th, press "SET", LCD show "LE.SET", digital box show min adopting value for saving, press "▲\*▼" can change;

4th, press "SET", LCD show "P.OFF", digital box show the setting time of power off, press "▲\*▼" can change;

5th, press "SET", LCD show "A.PE", digital box show peak releasing time, press "▲\*▼" can change current value;

6th, press "SET", LCD show "RS232", digital box show Print or PC, press "▲\*▼" can change the state. "PC" as serial output mode, connect to computer seeing test curving or export test data; "Print" connect to micro printer to print 10 groups of deposited test data report.

7th, press "SET", LCD show "DI", digital box show diameter of measuring tip press "▲\*▼" can change it, diameter of instrument measuring tip whether conform to the installing one, otherwise you can not get the right test value

8th, press "SET", all the changed setting are be saved, and return to test mode.

Note: In setup process, press "ZERO" can save settings and return to test condition

Universal power adapter 12V DC, 300mA.

#### 6、Reset hole



When the instrument is disturbed, it is to restart the sclerometer.

#### 7、Communication port

Serial (RS-232C) output, connect to computer to realise curve testing function, connect to micro-printer to print 10 groups testing data report (details “serial output and print” )

### Prepare operation

#### 1、Check power


Power on to check power, if screen show “” that lack of electricity, please support the power adapter to insert the output of charging machine interface, 220V/50HZ Acplug, “” indicate that they are charging full and automatically stop charging. when power on/off, it can be charged, even in charging, it also can do test.


#### 2、Installing measuring tips

After install measuring tip, check the diameter of instrument measuring tip whether conform to the installing one, otherwise you can not get the right value. (Details in setting part, installation in picture 5)




### Test

#### 1、Power on

Power on: Under the condition of turning off the gauge, on power and press “”, instrument come into self checking program, LCD screen show “SUNDOO” and model, the gauge come into normal working state.

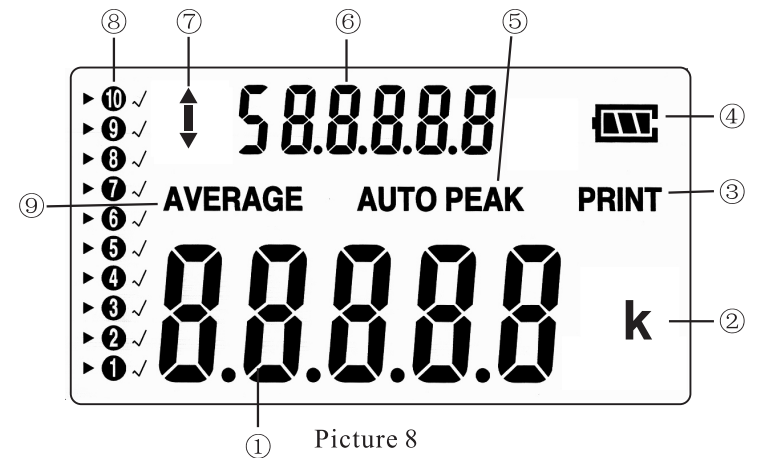
Power off: When power on and no working, the gauge will auto power off according to setting time or press “”.

#### 2、Clear zero



After switch on, when the data is steady, press “” to clear zero (note: range of clear zero is  $\pm 5\%$  of rated load). in peak holding mode, press “” can clean peak value. in setting mode, press “” can save setting value and be back to working state.

#### 3、Chosse test mode

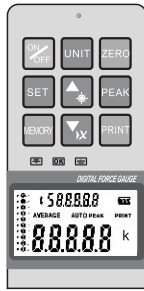
#### 1、LCD screen










① Picture 8

- ① Test value of fruit hardness, setting value in setting mode.
- ② Test unit. When no showing, it consent to MPa, show “K” unite is  $\text{kg}/\text{cm}^2$ , auto count of two different unit value.
- ③ When print test value, it show the mark.
- ④ Indicate quantity of power  
When quantity low, show “” or glimmer, need to be charged, when charging, “” glimmer, indicate charging.
- ⑤ Indicate test condition, when show “PEAK”, means peak holding; when show “AUTO PEAK”, indicate peak auto releasing; no showing, means test value track.
- ⑥ In save test data state, indicate dimension of test hand、auto count average of test data, point to test value、to be function indication in setting mode.
- ⑦ Indicate the direction of force.
- ⑧ Save test data  
“**1 2 3 4 5 6 7 8 9 10**” total 10 case, one case one test value mean this case is present deposited.  
▶ : Means this case to deposit and to read.  
✓ : Means this case is deposited.
- ⑨ Symbol for average.

## 2、Function button





Picture 9


-  Power on/off
-  Return zero, clear peak.
-  Inter-convert the units  
When no showing, it consent to MPa, press the button, show “k” , means the unit is kg/cm<sup>2</sup>.
-  Peak button  
Peak holding、peak auto releasing、test value track it consent to peak holding when power on.
-  Print button  
Connect to computer or micro-printer to transmit or print all test data. (Details “serial output and print” ) .
-  Memory button  
Memory test data and auto count the average, consent to save test value mode when power on, in this state, press the button, “AVERAGE” showing, it auto count the average; press it again, the mark disappear, it return to saving state.
-  Set button  
A. used to set alarm value upper and lower limits;  
B. storing the value of minimum value set collection;  
C. set up automatic shutdown time(1-60minutes is free to set up, 0 for not automatically shut down);  
D. set auto discharge of peak time(1-10seconds is free to set up);


- E. set serial output mode;  
F. set dimension of test head.



Plus key/background lights switch



A. In memory mode, press “” , “▶” will forward one case when print “” , the data has already saved once, the case appears “√” , if go on to test, the data will be instead of originally deposited data. if no “√” appear, it proved that the case is empty, new test data will be saved in this case.


B. In setting mode, press “” one time, the value will increase.


C. In average mode, press “” , it is the switch of background illumination.



Reduce key/delete key

A. In memory mode, press “” , “▶” symbol will backward one case. when print “” , the data has already saved once, the case appear “√” , if go on to test, the new test data will be instead of the originally deposited data in this case. if no “√” appear in this case, it means the case is empty, new data will be saved in it.

B. In setting mode, press “” one time, value will decrease one. Press it for a little while, data will decrease continuously.




C. In auto count average mode, press “” , all memoried data will be deleted.

## 3、Auto alarm indicator for outer limited value.

 Alarm indicator of upper limit

 Indicator for normal

 Alarm indicator of lower limit

Work in the state apparatus, when the measured value in the set, the minimum range of deviation, the normal indicator “” light, that qualified; when value exceed the upper limit, the upper limit of light “” , said a failure. when the value below low limit, “”light, said a failure test. it is to remind user that it is not the scope of test results.

## 4、Test hand

This sclerometer be with 2 test head, dimension in picture5.

## 5、Power adapter jack