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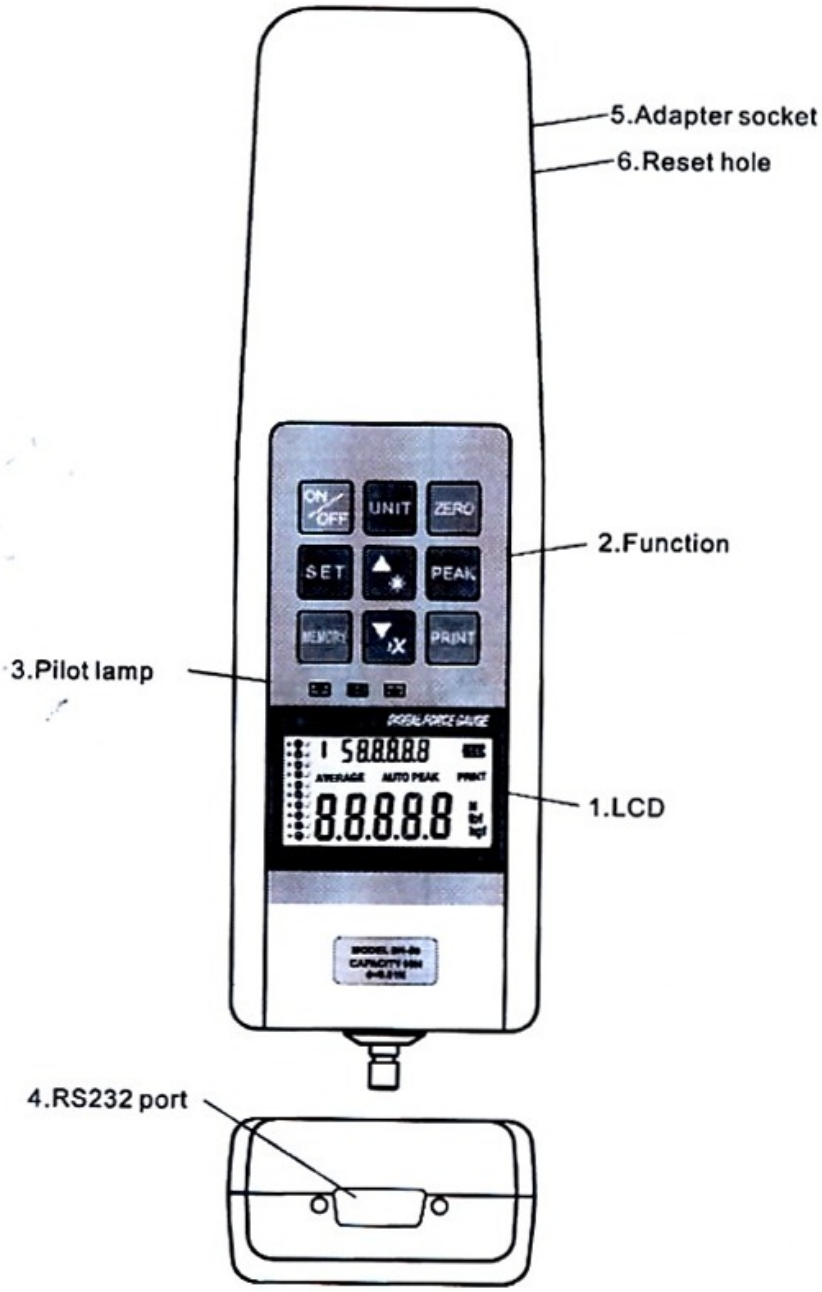
Manual
PCE-SH500

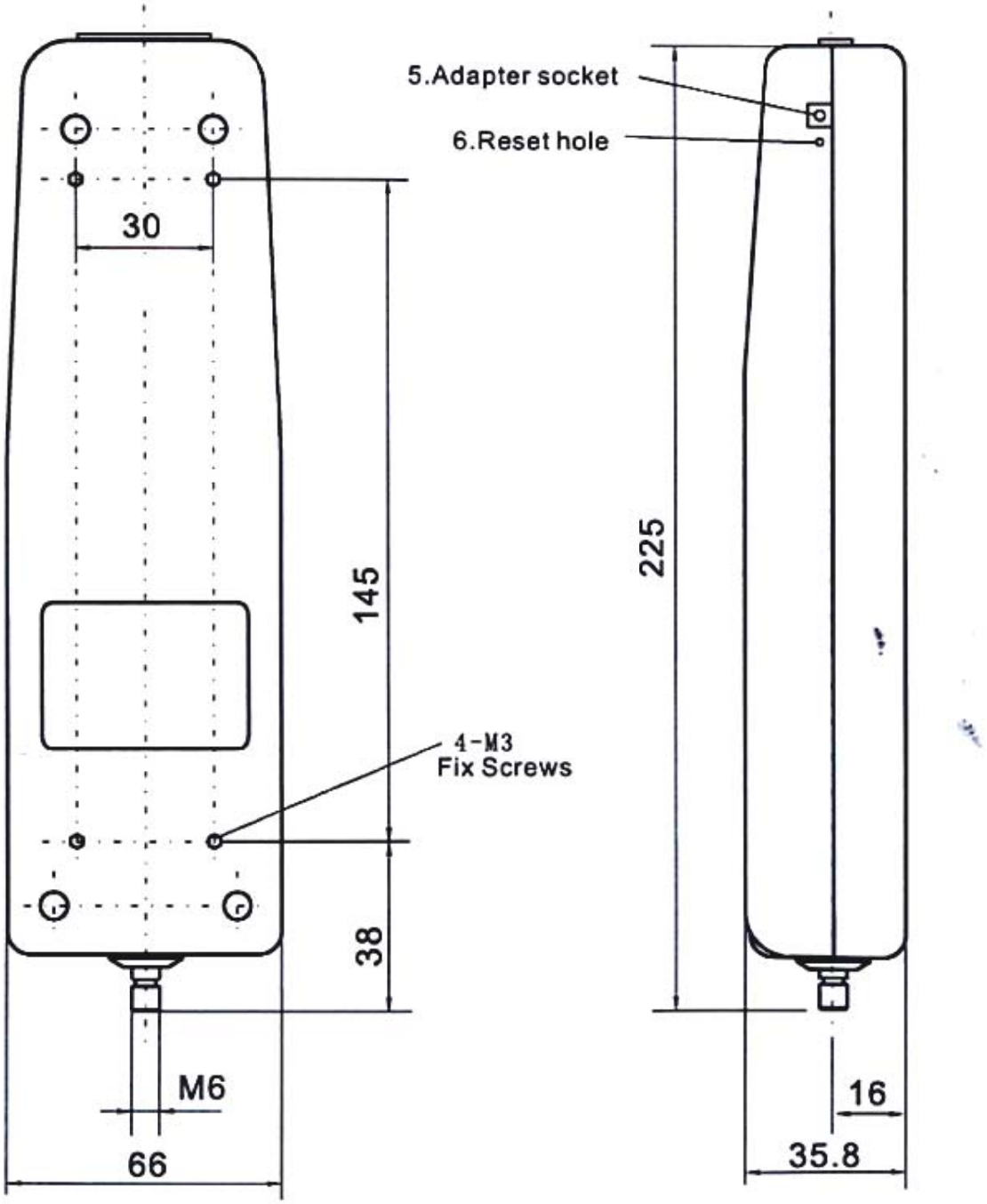
(SH Series Technical Specifications)

Model	SH-2	SH-5	SH-10	SH-20	SH-50	SH-100	SH-200	SH-500
Capacity	2N	5N	10N	20N	50N	100N	200N	500N
Resolution	0.001N	0.001N	0.005N	0.01N	0.01N	0.05_N	0.1N	0.1N
Accuracy	± 0.5%							
Unit	N.kgf.lbf							
Power	Ni-Hi 8.4V 1200mAh							
Sensor conformation	Sensor inside							
Work temperature	20±10℃							
Carry temperature	-27℃ ~ +70℃							
Relative humidity	15% ~ 80% RH							
Work entironment	No vibrancy and no cautery							

(SH Series Parts Apellation)



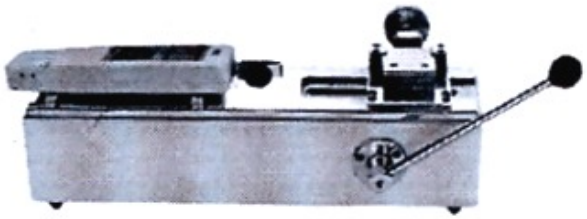
(SH Series Dimension Unit/mm)



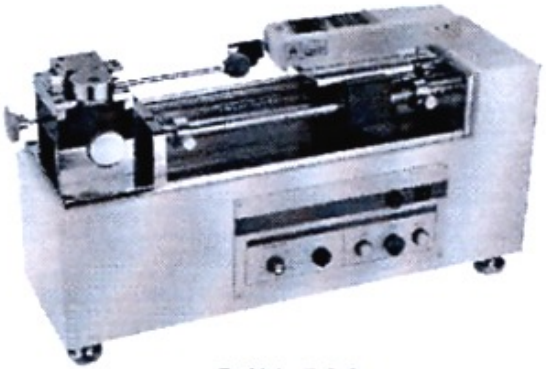
Test Stands, NoIncluded, Picture Only For Reference.

SLJ

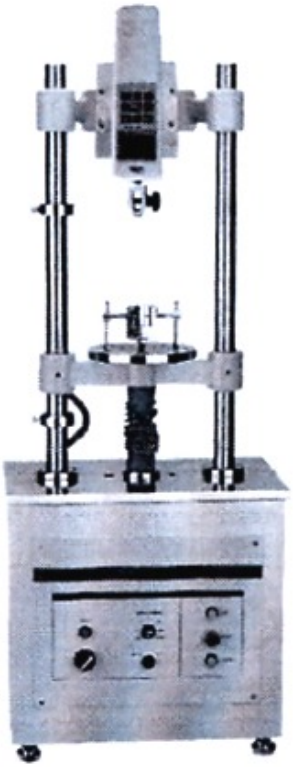
SPJ



SPH



SJH-500



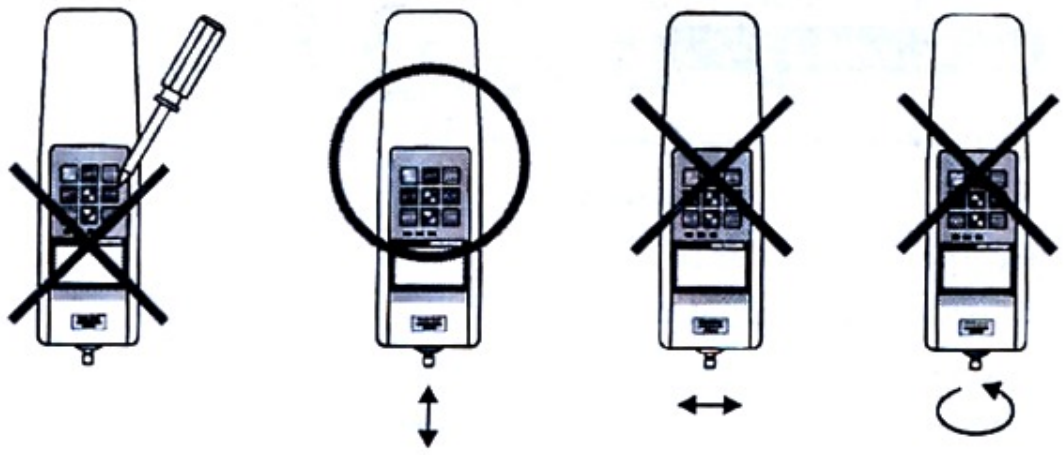
SJV-5K

Safety Precaution

⚠ CAUTION Wrong operation may damage the device or leads to serious result. There are important precautions and operation methods listed in our manual, so please read it before using the instrument. If shock load is tested, please choose the test stand with double load.

⚠ WARNING

1. In break down or shear test, wear protective mask to protect you from scattering pieces.
2. Do not use the damaged or warped clamps. Or this kind of clamps may be off or broken, leading the tested object fall on your foot.
3. When Error appears on the screen, the load has exceeded 110% of the capacity.
4. Do not use damaged or warped tools to press the button .



5. Do not load bending or twisting force on sensor.
6. Do not apply excessive load.Or the device will be damaged.

7.Do not use damaged or warped tips or hooks .
8. Do not use this gauge near water, oil or other liquids. Please store it in a dry and clean place.
9. U se adapted charger, or the electric break-down may happen even fire .
10. Use after inserting the AC charger into the socket .Any loose fitting may cause electric shock or fire.
11. Do not use the voltage exceeding the capacity , otherwise the electric shock or fire may happen.
12. Do not plug the adaptor with wet hand.

Functions

SH series digital push pull force gauge ,with compact size and high accuracy, is easy to operate and handy to carry. It can be used not only for measuring tension/compression force but also for various testing purposes such as switch test , insertion/withdrawing test and fracture test. Furthermore, it can also be matched with test stands and clamps for multipurpose measurement.

characteristic

※High accuracy and high resolution;
※Peak holding and auto-releasing;
※Upper and lower limit setting;
※Force direction indication;
※Blue background light;
※ Memorizing and calculating the average;
※ LCD screen direction turning;
※ Automatic power off
※ Units conversion

※RS-232C output port

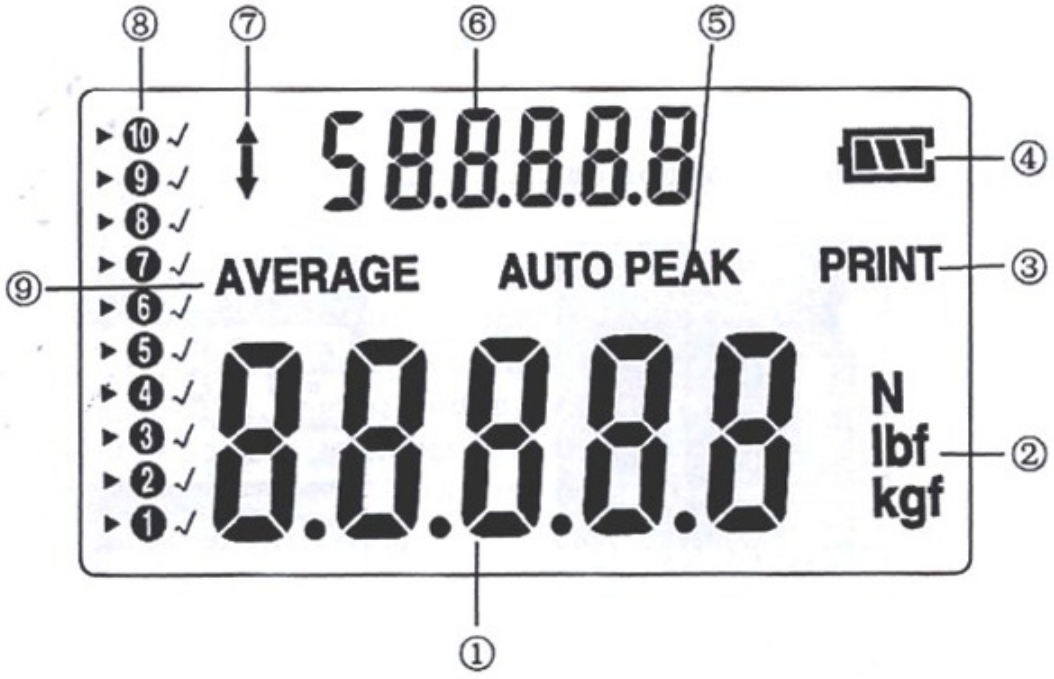
Specification

Please refer to P1.

Description of parts and function

Please refer to P2 for parts' description.

1. The LCD display window



The meaning of symbols:

①Displaying the measured value; in setting mode, it is the set value.
②Units of push pull force gauge. Three units" N" " Ibf" " kgf" are optional.
③Printing all the reserved data.
④Indication of power content.

⑤ "PEAK" means it is in the state of peak holding;

"AUTO PEAK", means it is in the state of auto-releasing.

⑥Auto calculating the average and the indication symbol in setting mode.

⑦Symbol of force direction

"↑" means tensile test and "↓" means compressive test.

⑧Memorizing the test value.

The force gauge can memorize 10 tested value . There are 10 grids on the LCD and each of them memorizes one tested value ."▶"Means the showing value and "✓"means the tested value has been saved .

⑨Symbol of average

2. The function of buttons

Picture A

Picture B Testing Reading Can Turn display

ON/OFF On/off button

ZERO Zero button

Press unit key for 3 seconds the LCD screen will change its direction.

UNIT Unit

Three units are optional and convert automatically

PEAK Peak

Switchof peak mode, peak holding, semi-peak holding and track. Track mode is default when the gauge is on.

PRINT Print

A. When RS-232C is set at "print" , pressing this button prints the tendata and analysis report.

B. When RS-232C is set at " PC", pressing this button and the " print" will will transmits the ten data to computer.

MEMORY Memory

Memorize the tested value and calculate the average of memorized data.

SET Setting

A.Pressing " set" button the first time, "HIDT" will appear on the LCD and theupper limit is set.Pressing "⊡⊡"changes the value.Pressing"set"button the second time, " LODT " shows on theLCD and the lower limit is set.

B. Pressing " SET" button the third time, "LE.SET"shows on the LCD and the data showed is the min memorized value. Pressing "⊡⊡"changes the (In the test, the data which is less than the min memorized value will not be memorized.)

C. Pressing "set" the forth time, the "P.OFF" will show on the LCD and the time of auto clean peak appear on the value display.

D. Pressing "set" the fifth time, the "A.PE" will display on the LCD and the time of auto clean peak appear Pressing "set" the fifth,on the value display.

E. Pressing "set" the sixth time, the screen will show "rs232" and data frame will show "pc" or "print" . Pressing"⊡⊡" changes the mode, "PC" means outputing the data to computer with RS-232C output; "Print" means transferring the data to printer. Pressing "set "button the seventh tmie saves the setting.

Add 1(the display direction changed is reduce 1)/background light switch
A. In memory mode, press it one time, symbol will forward one case.
B. In setting mode, press it one time, the value will increase one.
C. In the average mode, It is the switch of the background illumination.

Reduce 1(the display direction changed is add 1)/delete
A. In memory mode, press it one time, symbol will backward one case.
B. In setting mode, press it one time, the value will decrease one.
C. In the average mode, press it one time, all of memory data will be deleted

3. The Pilot lamp of upper and lower limit.

Pilot lamp of upper limited alarm

Pilot lamp of normal

Pilot lamp of lower limited alarm

4. Communicating port

RS-232C series port output the value data to PC or printer.

5. Power connecter

Suitable power adaptor with 12v DC ,300MA .

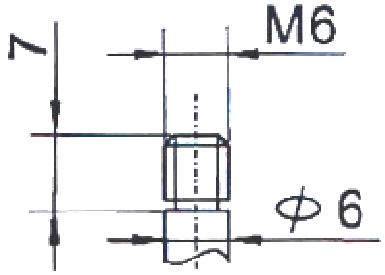
6.Reset hole

It is to restart the gange, when the gauge is strongly disturbed.

Preparation before operation

1. Check the power supply

When the power is on, check the battery. If the Ni-Hi batteries power islow, ▭ appears on the screen. Please charge battery by connecting AC adapter.Charge the battery as follows: Connect the AC adapter with the gauge first and then connect the adapter to 220V/50HZ power supply. Right after the charging started, ▬ is displayed. Charging time: 4 hours. Measurement during charging is possible and the batterycan be charged when the power is on or off.



2. Installing measuring tips

Please choose the best tip and fix it on the measuring shaft. Do not screw the measuring tip too forcibly, or the sensor would be damaged.

Testing

1.Turning on the power

When the power is off, connect the power and press " oFF/ON" button to make the power on. Then the screen will show " SUNDOO" and the model of this gauge, and that means the gauge is in normal condition. When the measuring tip loads the object with not over 5% of the load capacity, the gauge has the automatic cleaning zero function; on the contrary, when the object is over 5% of the load capacity, error may happen so please use light tips. When the power is on, pressing button makes the power off. The gauge will turn off " oFF/ON" itself after the set time when it is not in operation.

2.Zero cleaning

After the gauge is turned on, pressing " ZERO " cleans the zero after the reading the stable. The range of zero cleaning is ±5% of the capacity. Pressing cleans the peak while it " ZERO " is in peak-holding mode and saves the set value in setting mode.

3.Test mode choosing

The force gauge provides three kinds of test modes: track mode, peak holding mode and auto-releasing of peak. The track mode is default when the gauge is turned on and there is no "PEAK"on the screen. After pressing"PEAK", the screen will show "PEAK"and it is in peak-holding mode and the value showed on the gauge is the max value the shaft can bear. Pressing"AUTO PEAK" and the auto-releasing of peak will be delayed. The reasing is the max value the sensor can stand. The reading will be cleaned after 1-10 seconds. The three mode can exchange when the "PEAK" is pressed every time.

4.Selection of unit

Pressing"UNIT" converts the units: N, kgf and Ibf.

5.Setting upper and lower limits, min captured peak value, auto power off time and RS-232C output connection.

a.Pressing setbutton the first time makes the screen display "HIDT" and the upper limit is showed in the digital frme. Pressing "set" button the second time makes the screen display lodt and the lower limit is showed in the digital frme. Pressing" ▲▼ "changes the value.

b. Pressing"set" the third time makes the screen show "LE.SET" and the min captured peak value is displayed in the digital frame. Pressing " ▲▼" changes this value. Data which is less than this value will not be memorized.

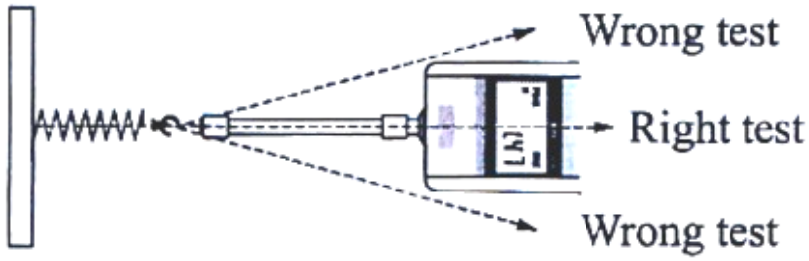
c. Pressing"set" the forth time makes the screen show"P.OFF" and the digital fram will show the time of auto power off. Pressing"▲▼" changes the value.

d. Pressing"set" the fifth time makes the screen show"A.PE" and the digital frame will show the peak auto-releasing time. Pressing"▲▼" changes the valuc.

e. Pressing"set" the sixth time ,makes the screen show"RS232"and "PC" or"Print" will be showed in the digital frame. Pressing"▲▼ " changes the value."PC"means outputing the data to computer with RS-232C output; "Print" means transferring the data to printer to printing the 10 memorized data.

B.Testing

Please hold the gauge or fix it on a suitable test stand. Keep the gauge and the measured object in a line, otherwise the value will not be correct.



C. After testing

After the test is finished, turn off the power and take off the measuring

tip, then clean and put all the parts and accessories of the gauge into the case.

Test stands its appurtenance

This gauge can be fixed with various test stands for multi-purpose, testing insertion/withdrawing force, push pull force and fracture test.

After Measure

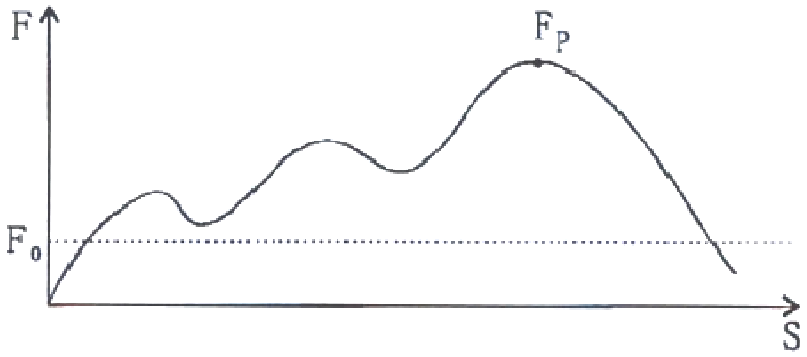
Turn off the power source after your measurement. Then clean and put all the parts and accessories in the carrying case for next time to use.

Test stand & Appurtenance

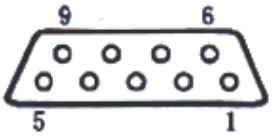
This gauge can be fixed with various test stand as multipurpose test stand for measurement of tension/compression force, insertion/withdraw test, and fracture test, etc. (View the page 4)

About Memory & Peak Capture Line

If you need to use the memory function, Please set the Peak capture line "F". In the test, the gauge will remember the Peak value, which is above "F" . The value is absolute value. When the force is over than F_0, the memory function start to memory the max value in the test; the force is less than again, one time of test is F_0 completed. If the peak value is lower that"F"in one test, the peak value is not memorized.

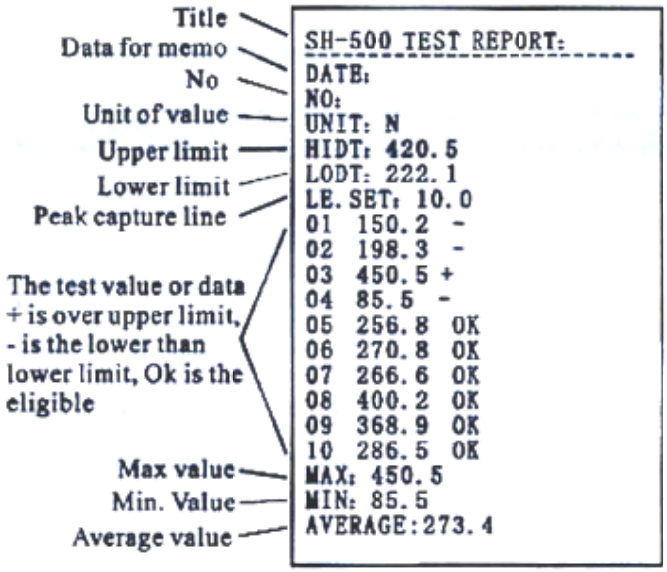


When peak value is saved, the saved case will show" ✓ ", and the " ▶ "will be up to lower location. The gauge can memorize 10 values. If the value is more than 10 values, the new value cover original



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 lower limit
8	+2V	Ok is the eligible

1. When RS-232C output is set at "Print", theprint will flicker when "Print"is pressed and ten groups of data and analysis report will be printed. Please refer to the picture on right.



2.When RS-232C output is set at PC,the Print will flicker and when "Print"is pressed, ten groups of data will be transmitted to computer.Specific method of connecting apparatus and computer is in the Following:

A. Connect the push pull force gauge to PC with RS-232 cable;

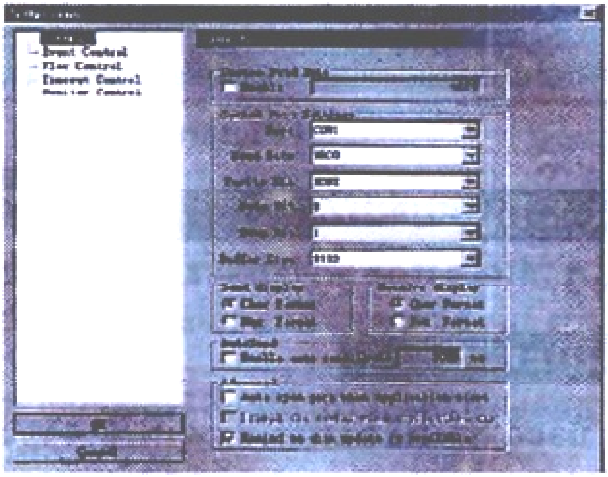
B. Turn on the gauge and make it on the working state,then set RS-232C to the state of output to PC. Please refer to the in P13.

C. Insert the accessory CD into computer and open the following path:CD-ROM drive\Chinese\SH and ST port software\ SundooPort\SundooPort.exe;This software need not be installed, and you only have to copy the SundooPort folder to computer hard disc and then double click it.

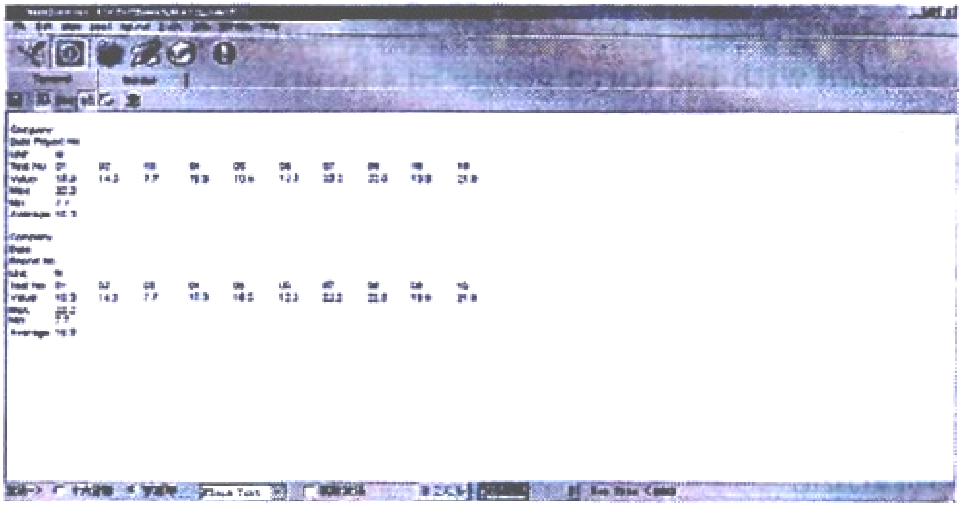
D. Single click the tool on menu columnparameteroptional dialogue column, then set the parameter(picture1). Choose the port: COM1 or COM2 which correspond to the port line.

E. Data can be received by pressing " print " on the torque meter. Refer to picture2.

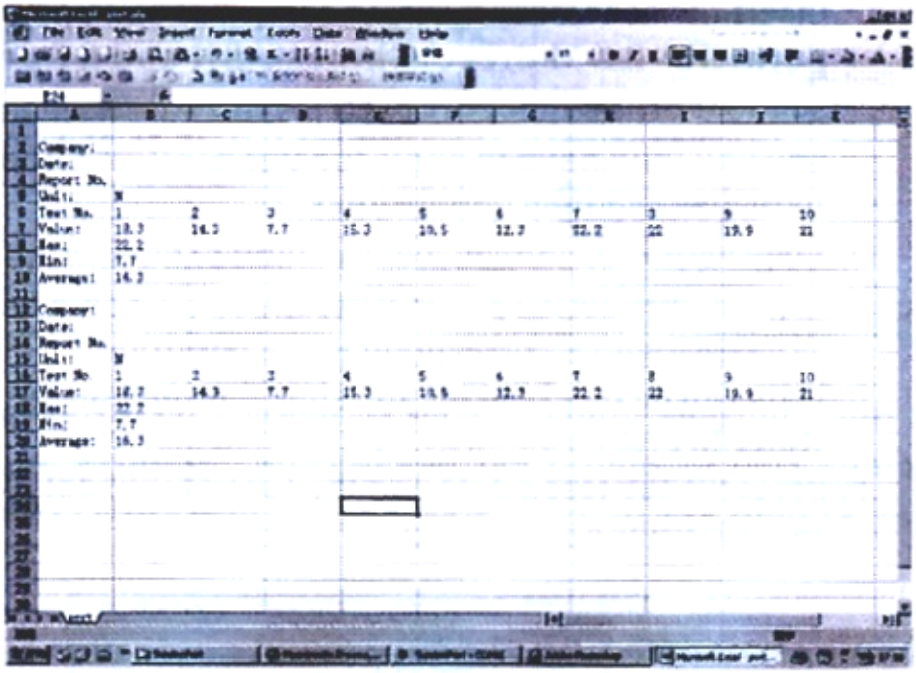
F. Preserve the tesed data and the format is excel electronic form and TXT plaine text form.



(Picture 1)



(Picture 2)



(Picture 3)

Appearance & Install Size

View the page 3.

Charging battery

This gauge is used Ni-Hi batteries with 8.4V/1200mA as power. The fully charged battery can work in 12 hours continuously . If Ni-Hi batteries power are low, [LO BAT] appears on the display.

Please charge battery by adapter, the adapter is 12V.DC/300mA.which is provided with the force gauge in 4 hours.

Cautious

1. The frequent and long time charging battery will shorten life of battery.
2. Please charge the battery after exhaust the power, that will cancel remember effect .
3. You can use the gauge in charge battery.
4. The life of battery: charge/discharge over 500 times, with normally operation.

Charging Batteries

Packing list

Item	Parts name	Quantity
1	Main body	1
2	AC adapter	1
3	M3X8 Screws	4+1
4	Extensive Shaft	1
5	CD-ROW	1
6	Users manual	1
7	Qualification certificate	1
8	Accessories	5

Maintains

1. Clean dirt and dust from gauge with soft cloth. After dipping cloth in the Neutral detergent water and squeeze out water, and clean dirt with thé Cloth.
   Do not use volatile chemical liquid to clean the gauge, such as benzene, thinner, alcohol, etc.
2. Handle carefully during use and carry.
3. Never disassemble, repair, and remodel the gauge yourself.
   Should you perform any if do as these, that may cause malfunction of the gauge.
4. If malfunction, please contact original sale department or out company.

In this direction will find a vision of the measurement technique:
http://www.industrial-needs.com/measuring-instruments.htm

NOTE: "This instrument doesn't have ATEX protection, so it should not be used in potentially explosive atmospheres (powder, flammable gases)."