CL-03 force measurement display controller

MANUAL

CONTENT

This instrument can digitize the measured force data by the single-chip microcomputer according to the use requirements.

It can be used in the display and control part of various presses and testing machines, and has a wide range of uses.

I、Parameters

Rated working voltage:220V±10%,50Hz

Working temp.： 0～40℃

Power consumption：≤30VA

Size：360*140*210mm（Assembling size 345*125mm）

Print thermal paper： 57mm

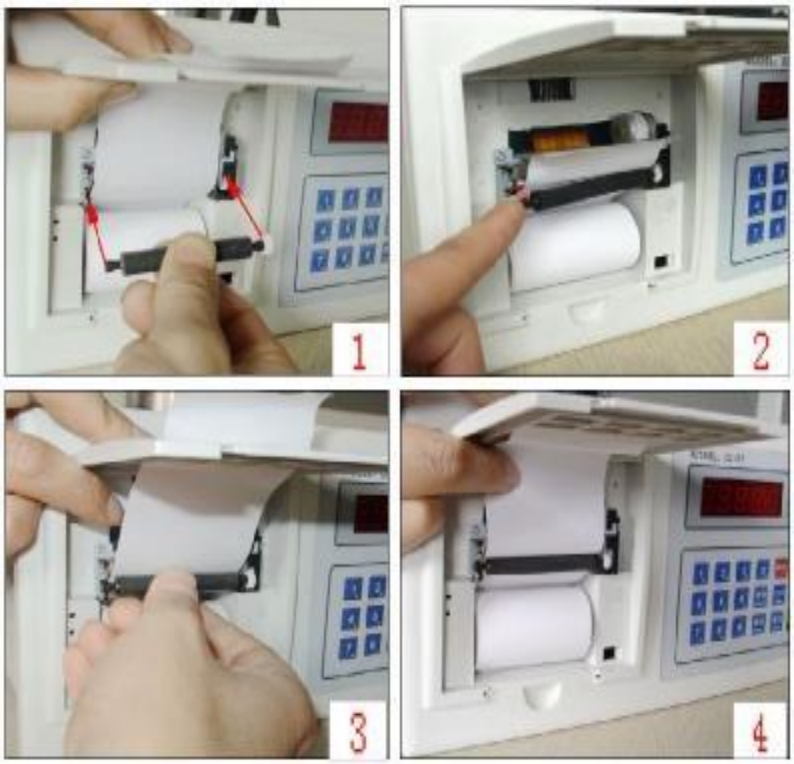
Fuse： 15A

II、Introduction

1. Time display: year, month, day, hour, minute.
2. Specimen cross-section code setting:
    1. For cubic compression specimen with a cross-section of 100mm × 100mm.
    2. For cubic compression specimen with a cross-section of 150mm × 150mm.
    3. For cubic compression specimen with a cross-section of 200mm × 200mm.
    4. For non-standard compression specimens of any cross-section.
    5. for 150x150x550 mm flexural specimen.
    6. for 100x100x400 mm flexural specimen.
    7. For compression specimens with a cross-section of 40×40×160mm.
    8. For compression specimens with a cross-section of 70.7×70.7mm.
3. Data storage: This instrument has the ability of data memory. The instrument number is 000-9998#, and each test unit includes 3 or 6 test values and average intensities.
4. The RS232C interface is used for the communication with the computer if necessary.

III、Installation and operation

1、The figure shows how to install printer paper



Step 1: Open the printer cover and put the paper into the roll paper deck, and at the same time put the paper out of the printer cover, and do not misplace the obverse and reverse side positions of the printer paper.

Step 2: Insert the rubber roller into the corresponding bayonet.

Step 3: Adjust the position of the rubber roller, press and hold the rubber roller firmly, and pull the printer paper at the same time to check whether it rotates normally.

Step 4: After the installation is complete, close the printer cover and test whether the printing is normal.

2.Time setting: When using for the first time or after a long period of use, the clock of the machine should be checked and adjusted, and no setting is required during normal use.

Press the "Clock" button, and the gauge displays:

1WINDOW
WINDOW1

2WINDOW
WINDOW2

Display window 1 displays: "——2010", which represents the year, and display window 2 displays: "02-25" indicates the month and day.

If it is incorrect, you can enter the numeric button to modify the flashing bit, and then press the "EXIT" key to move the flashing bit, and press the "enter" key after modifying the year, month, and day, and

Window 1 of the gauge displays: "---08" indicates the hour.
Window 2 displays: "20-10" for minutes and seconds.
If it is incorrect, it can also be modified with the number key and the "EXIT" key (to implement the shift), and the "ENTER" key saves the exit.

IV、Operation in compression test

(1) Place the specimen on the testing machine. Make the upper pressure platen downward closing to the specimen by turning the lead screw. Care must be taken that the upper pressure platen should not touch the specimen. Turn on the testing machine to make the cylinder rising slowly. Press “Clear” key to remove the tare.
(2) Press the "Test" button, the gauge displays:
Window 1 reads: "D0001". Window 2 reads: "S—282".
The 0001 in "D0001" refers to the group number of the specimen,
282 in "S-28" refers to the number of concrete age days,
2 indicates the cross-section code 2, and the cross-section is 150mmX150mm.
Note: The cross-section codes are shown in clause 2 of the "Specimen cross-section code setting".。

(3) Input of group number, days, and cross-section code: For example, when do the 132nd group of specimen, after typing the numbers 0,1, 2,3, window 1 displays d0132, press the "ENTER" key, window 2 displays "S-282", the cursor flashes on the number 8, and the age days can be re-entered according to the need, (can be set to 3, or 7, or 28 days) press the "ENTER" button, the cursor flashes on the cross-section code, enter the code according to the cross-section of the specimen, and press the "ENTER" key to complete.

(4) Compression test process: After inputting the group number, concrete age days, and cross-section code, the user can continuously carry out the compression test of the specimen: put in the first specimen, open the oil delivery valve to load until the specimen is broken, and open the oil return valve, (hold the peak for 9 seconds, if you find that there is a problem with this test, you can press the "0" button to cancel the number.)
Swap in the 2nd piece of the specimen and load until the specimen ruptures, (also hold the peak for 9 seconds.If there is a problem in the test, you can press the "0" key to cancel the data) and then replace it with the third test piece, after the end of the test piece, the gauge will automatically print out the test data of the group (if the cross-section code selected by the user is 7 or 8, the gauge will print out the results of the group of tests after the end of the 6th test piece), and then you can continue to do the next group of tests, or press the "EXIT" key to exit the automatic test state.
During the test, if you want to cancel the test results of a certain group of specimens, you can directly press the "TEST" key, re-enter the group number and cross-section number, start the test, and the instrument will record the latest data of the group.。

(5) Data search and print:

(A) After a set of test pieces is completed, the gauge automatically prints out the test results, and at the same time tells whether the data is qualified, and calculates the average value if it is qualified.
(B) Query: press "INQUIRE", window 2 displays "d0000", and the single digit flashes, at this time input the group number, such as 012 (check the test data of the 12th group), "ENTER", the gauge displays:：
Display window 1：8 0 0.2 0 (peak value of this specimen compression test）
Display window 2：3 —— 1 （the 1st of 3 specimens），press “ENTER”again，

Then display window 2 shows“ 3 －－ 2 ”， and window 1 indicates the peak value of 2nd tested specimen, press “ENTER”again to move on to the 3rd specimen. Press “ENTER”after getting its peak value. Press “ENTER”to return.
(C) Search and print: press "INQUIRE", window 2 displays "d0000", enter the group number you want to print, such as 012, and then press "Print" to print out the test results of the 12th group of specimens.
(D) If the measured value is over 15% different from average value, the specimen is invalid.

Qualified data printing format

VALUE

(KN) (MPa)

1：800.01 35.55

2：800.46 35.57

3：800.24 35.56

AVARAGE value：

800.20KN

35.56MPa

001# S:15*15

Age(days)：28

2004 Y 05 M 10 D 14:21

Unqualified data format：

VALUE

(KN) (MPa)

1：167.98 7.5

2：251.58 11.2

3：355.15 14.9

AVARAGE value：

001# S:15*15

Age(days)：28

2004 Y 05 M 10 D 14:21

V、Verification and Calibration

In the use of this machine, except for legal metrology staff, users should not enter the calibration state at will, otherwise it will be
If the internal data is corrupted, the machine will not be able to work properly.

1、Calibration：

Three minutes after the gauge is switched on, it is carried out with a third-class standard force measuring machine in a random state, and the steps are as follows:

①、Setting of calibration points

The calibration points of this gauge have been set at the factory. The calibration points are 10%, 20%, 40%, 60%, 80%, and 100% of the full scale, respectively.
The calibration points of the 2000KN press are: (200KN, 400KN, 800KN, 1200KN, 1600KN, 2000KN, 0000KN).

The 300KN press is calibrated (50KN, 100KN, 150KN, 200KN, 250KN, 300KN, 0000KN）

The following takes the 2000KN press as an example and sets the calibration point：

Press“CALIBRATE”button，

1 window shows：b------

2 window shows：-------

Then input password 11111（or 12111111）press“ENTER”，and gauge is on

calibrated state： 1 window indicates：b 1（Indicates a calibration of 1st point）

2 window shows：0200（Standard force point setting）

Press the "ENTER" button to proceed to the next calibration point setting. Set the second standard

force point in window 2 and continue to set all the rest standard force set points in this way.。

Taking the 200T(2000KN) press test machine as an example, a set of calibration points is designed, which, if calibrated according to the table below, can meet the accuracy requirements of the full scale from small tonnage to large tonnage. The recommended calibration points are:

1 WINDOW(calibration point)：	2 WINDOW(force/compression point)：
b — — — 1	0200 (10%)
b — — — 2	0400 (20%)
b — — — 3	0800 (40%)
b — — — 4	1200 (60%)
b — — — 5	1600 (80%)
b — — — 6	2000 (100%)
b — — — 7	0000 (means END, **cannot be omitted unless b---10 occurs**)

The overload protection point has been set automatically at 103% of full scale.

Because this gauge can mark up to ten points, when the calibration point is less than ten, after the last point, set a 0000 compression point to indicate the end of the calibration point. When the calibration point is 10 on window1, the end point does not need to be calibrated.。

②、Calibration of calibration points

（1）Press “Calibrate”，1 window shows：b - - - -

2 window shows：- - - - -

Input password or （12000000）and press “ENTER”，the gauge will enter calibration condition：

1 window displays： 0 0 0.0 4 (random number，no meaning)

2 window displays： b 0 0 0 0 （means 0 KN）

（2）Load smoothly, when the force measuring ring is about to approach the upper platenn, press the "ENTER" button to make the gauge confirm the zero point,

At the same time, the calibration of the first calibration point is entered.

1 window displays：189.3 0 （random number, no meaning）

2 window displays：b0200 （means 1st calibration point as 200kN）

Smooth loading, when the force ring pointer is close to the standard force value displayed in the lower window(2window), slow down the loading speed, when the testing machine reaches the standard point (based on the standard force ring reading), press the "ENTER" button, so that the actual pressure of window 1 is the same as the standard force value of window 2, and enter the next calibration point at the same time.

（3） Calibrate each point in turn until the gauge automatically exits the calibration state, (or press the "Exit" button to exit,) the calibration is completed. CL-03 can be calibrated with a total of 10 points from 0 to 9, if calibrated according to the corresponding proportion of the 200T testing machine recommended by our factory (see the manufacturer's guide), it can meet the accuracy requirements of the full scale. The instrument also provides the user ≥ 2 and ≤ 10 points, if the last point of the user mark does not reach the full scale, the instrument will automatically climb to the full scale.

2、Calibration data storage

Press “calibrate”button，

1 window displays：b - - - -

2 window displays：- - - - -

Input password 44444(or 82123150) and press “ENTER”, gauge indicates“.....” to be normal, which means finishing the storage of calibration data.

3、Verification(CHECK)

①Preheating: After the instrument is energized for three minutes, the load is loaded to the full scale of the testing machine and then unloaded, and repeated three times；

②Verification zero point: press the "CHECK" button, and the gauge enters the verification state，

1 Window displays: 0021 （actual pressure/force value）

2 Window displays: d 0000 (means verification zero point)

2 window displays：d0000, means number zero verification point is 0 kN。

The 1 window shows the actual force value, and if the value is not zero in the no-load state, it will be loaded smoothly to make the force measuring ring close to the top platen.

Press the "Clear" button , and press the "ENTER" button when the gauge shows 000.00 (±0.3 is the allowed value).

③Verification of other points: After confirming the zero point, the verification of the first point will be entered. Gauge displays：

1 window displays: 198.00（actual pressure/force value）

2 window displays： d 0200 （means verification 1st point,200kN）

Type in the pressure value of point 1 to be verified, e.g. 10% of the rated load, taking the 2000KN pressure testing machine as an example, i.e. 200KN, the actual force value is displayed in 1 window. Load smoothly, slow down the loading rate when the force value read out on the standard force ring is close to the force value to be verified, and press the "ENTER" button when it reaches 200KN. Go to point 2 for the test.。

2 window displays：d 0 4 0 0，

Load smoothly and press the "ENTER" button when the force value from the standard force measuring ring reaches 400 kN. The same goes for the other points.。

The instrument can verify up to 0-9 a total of 10 points, can also check less than 10 points, if you only want to check 5 points, then just after the 5th point is not entered, directly press the "exit" key to complete the verification. The gauge prints the results automatically.。

When the gauge has completed the 10th point, press the "ENTER" button to complete the verification. The gauge prints the results automatically.。

④Manual printing of the verification report: press the "INQUIRE" key, press 9999 in the 2 windows, winch means, the 2 window displays D9999, and then press the "Print" key to print out the results of the last verification. (Less than 10 points can be checked for verification, and only the inspection points are printed out when printing). The results of the verification are as follows:

VERIFICATION DATA

Standard force （kN）	Measured result （kN）
0:0000	0000.00
1:0200	0200.25
2:0400	0399.75
3:0800	0799.95
4:1200	1200.35
5:1600	1599.25
6:2000	1999.95
7:0000	0000.00
8:0000	0000.00
9:0000	0000.00

2003 Y 01 M 9 D 14:25

According to this table, confirm whether the testing machine is qualified. If it is qualified, the

verification is over, and if it is unqualified, it needs to enter the calibration state to re-calibrate the machine. For calibration, see "**Ⅴ、 Verification and Calibration**".

4、Range setting

This gauge can be applied to pressure testing machines of different tonnages by setting different capacities, with a capacity of 2000KN for a 200-ton testing machine, a range of 300KN for 30 tons, and so on.。

Range setting method： press“CALIBRATE”，

1 window displays：b - - - -

2 window displays：- - - - -

Input password 88888，(or 12888888)

Press”ENTER”.

2 window displays the range set by the gauge, "E-----" can be modified to any value not higher than 3000.and press the "ENTER" button to save.。

Note: When the gauge receives exceeded 3% of the measuring force, the alarm outputs and displays "H H H H H" in window 1.。

5、Setting the number of a group of any area

After press”CALIBRATE”，

1 window displays：b - - - -

2 window displays：- - - - -

Input password 10000，press “ENTER”，and 2 window displays：XX，which means the number of specimens in a group when using any area (Other area codes do not work, or the relevant cement standards shall prevail). Set the number and press the "ENTER" button to save. When using any area of size 4 for an experiment, the number of tests and the number of prints are the set number.。

6、Data calculation settings

Press “CALIBRATE, and input “12 666 666”, and press“ENTER”， then 2 window displays：XXXX，from left to right in turn as “Thousands, hundreds, tens, singles”

Single digit = 1: There is an area correction when calculating MPa. Single digit = 0: Calculate MPa without area correction.

Ten digits = 1: When calculating the average, the data set that fails to pass is detected.

Ten digits = 0: When calculating the average value, the unqualified data group is not detected and the average value is calculated directly.

Hundred=1: A group of 6 when doing the area of number 7 and number 8. Hundred=0: A group of 3 when doing the area of number 7 and number 8. Thousand=1: MPa is 2 decimal places.

Thousand=0: MPa is 1 decimal place.

For example：0011 a group of 3 specimens

0110 a group of 6 specimens

Note: When the cross-section code is selected as 7, the specimen of 40*40*160 should be set to 0110, and 0011 is commonly used for the rest of the sections. Factory set to 0011.

The self-test method for the sensor in Appendix 1 is as follows:
(1) Press "Calibrate" to enter the 5-digit password 99999 and press the "ENTER" button to confirm.
(2) At this time, the force value screen displays "—005", the rate screen displays "XXXXX", and the last digit is beating, one will be big, and the other will be small.
(3) Put a test block, with the force of the press, the number of the rate screen is gradually increasing.
(4) If there is no above phenomenon, it is certain that there is a problem with the sensor.

Appendix 2: Simple Troubleshooting Methods for Meters:

Trouble	Reason	Solution	Remarks
The testing machine reports an alarm or the motor stops	The pressure exceeds the maximum range。	Uninstall	For example, when the measuring range is 2000KN and the force is greater than 2060KN), the gauge will output an alarm signal.
During the normal pressure test, the meter shows "HHHHH"	Incorrect setting of range	Check that the range settings are correct, or reset them.	
Gauge displays "FFFFF"	The sensor input signal is incorrect	Check the sensor's wiring, or replace the sensor.	
The printer does not print	No paper or paper is stuck	replace	At the beginning, the mechanical device is too tight, gently pull out a little bit of the paper, and then hit it
The displayed value is not accurate, or it is very different from the actual value	The sensor is damaged or incorrectly calibrated	Replace the sensor or recalibrate. Or restore the calibration data	To recover data, press the "Calibrate" key to enter: 55555 or 82029910, and then press the "ENTER" key to complete. Turn off the power and turn it back on, press the "Clear" button