

**Tensile testing machine  
RBL-200B**

**Operation**

**Manual**

# Foreword

Thank you for purchasing our testing machine.

This manual details the operating procedures, maintenance methods and simple troubleshooting and precautions for use.

Please read this manual carefully and follow the prescribed procedures to ensure that you can operate it smoothly every time. Please keep in mind the precautions to avoid machine failure due to improper human operation. Proper maintenance methods can extend the life of the machine .

All products of our company have passed strict quality control inspection before leaving the factory, you can use it with peace of mind, if you have any difficulties or problems, please contact our company directly .

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# 1. Quick Start

## 1.1. Quick test steps

The first step: start the software, double-click the icon on the desktop to open the software, as shown in the following figure:



Step 2: Click "Communication Settings" in the toolbar on the upper left corner to select the available COM port, and click "OK", as shown below:



Step 3: Enter information about the tester and sample name in the test information.

Step 4: Select the sample to be tested in the editing sample data and fill in the relevant information of the sample data;

Step 5: Enter the relevant control parameters in the edit test plan.

Step 6: Install the sample, click "Start Test", wait for the test to be completed and automatically calculate the test result. Now that the test is complete, if you want to output a report, you can click "Export Word Report" or "Output Excel Report" in the "Test Results" tab to output a report in the corresponding format.

## 2. Main interface

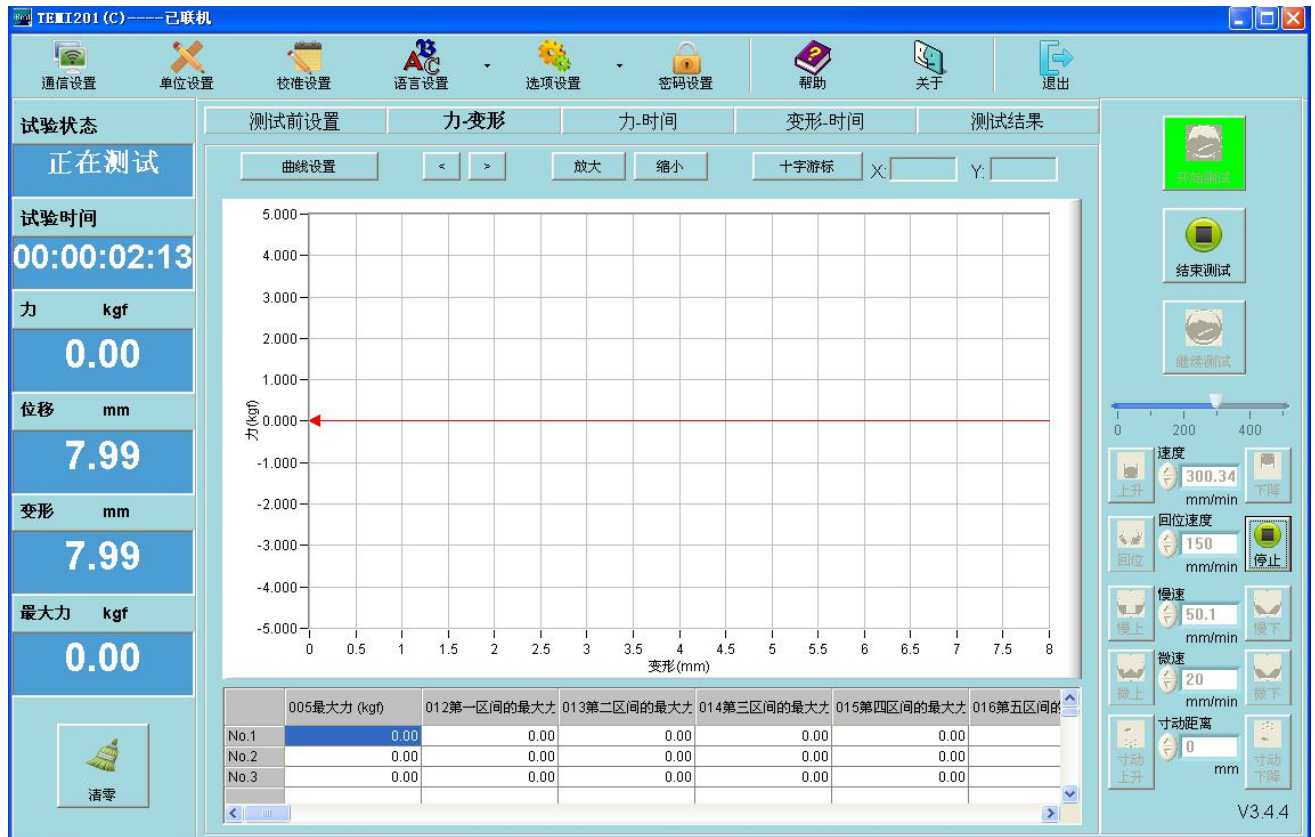
After starting the software, the main interface is as shown in the figure:



- Edit sample data area: edit the sample gauge length, area, width, thickness, inner diameter, outer diameter, area after break, gauge length after break, etc.
- Edit control scheme area: edit "control method" and "control parameters".
- Control plan step display area: displays the control plan operation steps.
- Jog up and down distance settings.
- The speed at which the system rises or falls.
- **Display bar** : displays the measured values of the current channel, such as force, displacement, deformation, etc.

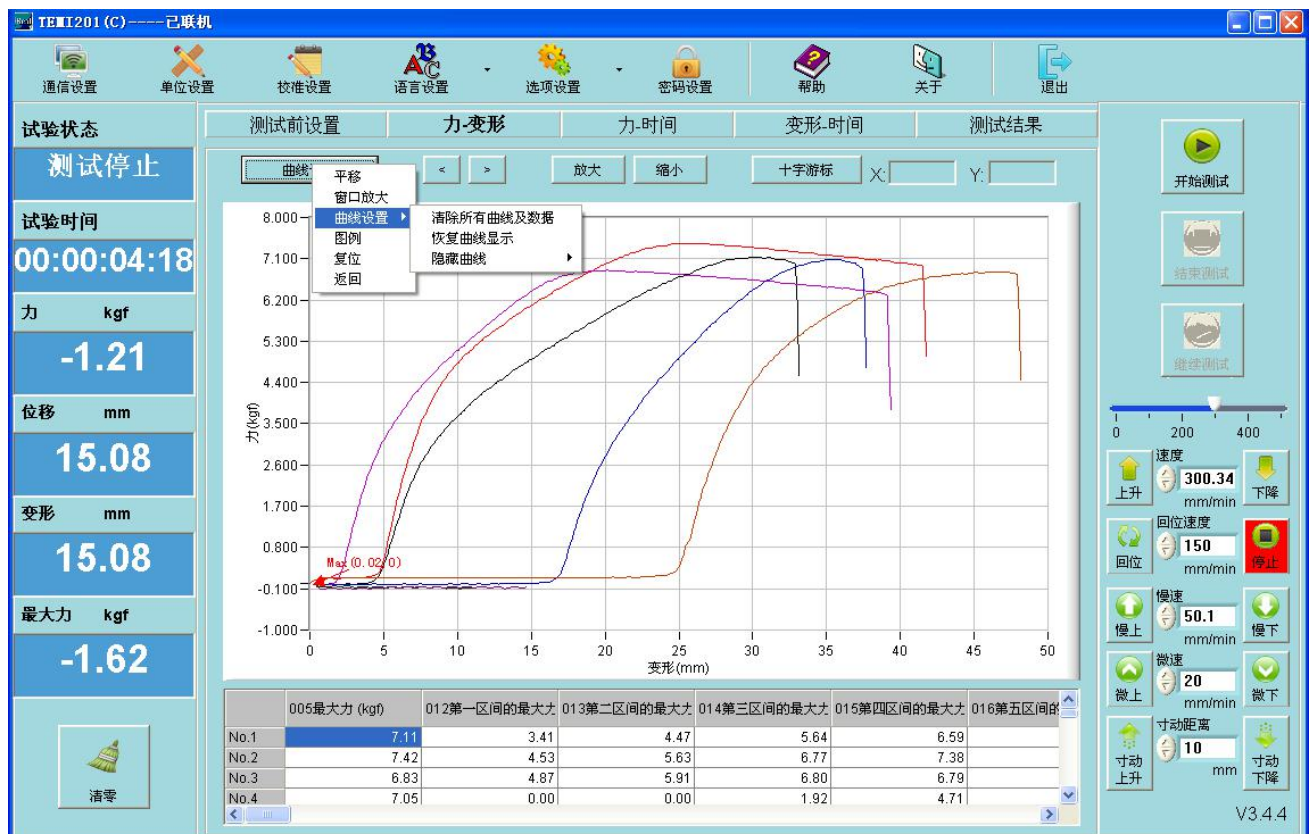
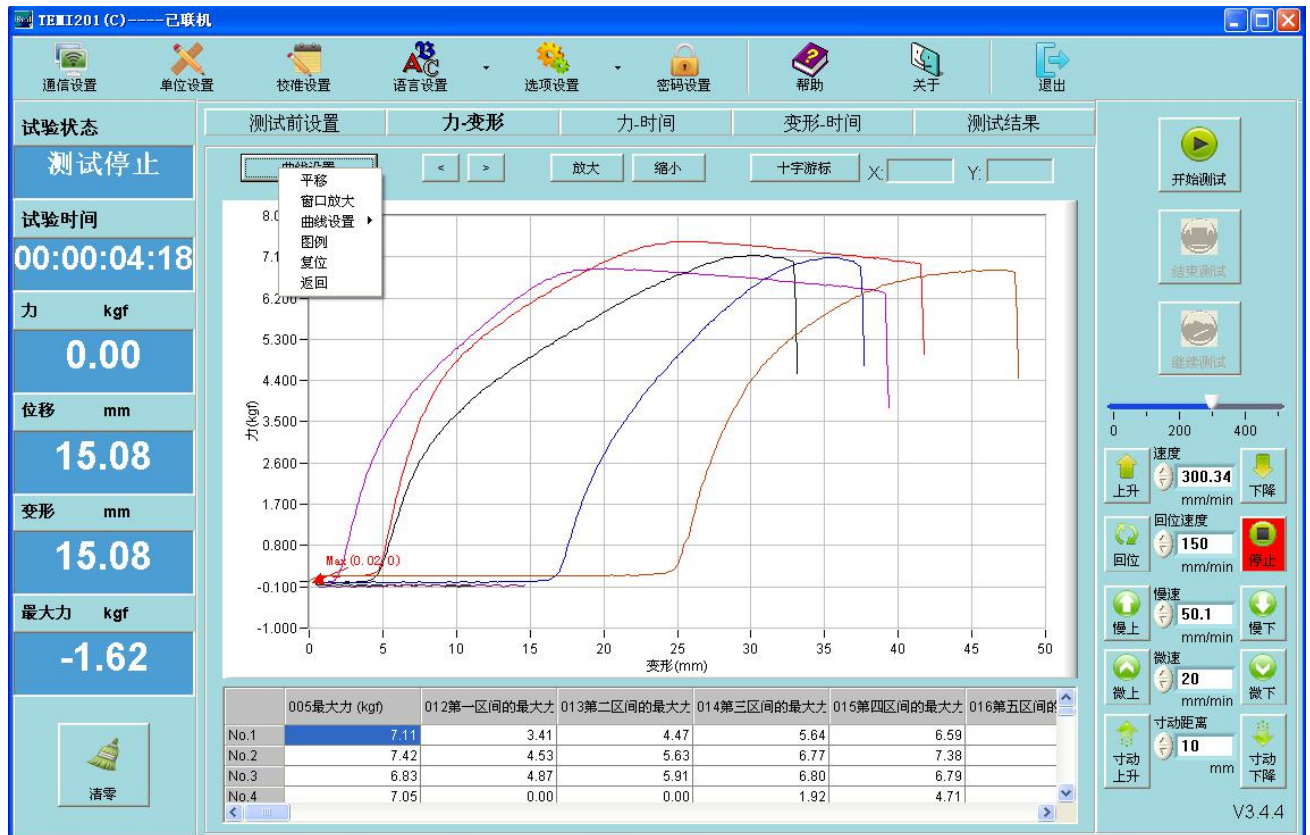
- **Toolbar** : The toolbar contains some common settings. Such as: unit settings, calibration settings, etc.
- **Control bar** : Control buttons for the machine, such as up, down, and start testing. "Return" means that the machine automatically returns to the position where the displacement is 0 .
- **Status bar** : Display some status information.
- Connection status: When the software and the machine are connected normally, it displays "connected", otherwise it displays "disconnected".
- **Test work area** : Contains pre-test setting items, graphs and test results.
- Setup items before testing, including: test information, sample data and test plan, for details, please refer to " [Edit Sample Data](#) " and " [Edit Control Plan](#) ".
- The curve graph can display the current test curve and historical curve. ,As shown below:

## 2.1. Being tested





## 2.2. Curve setting



## 2.3. Test results

Calculate the test results, you can get different test results through the result selection, or you can click "Save Specified Record" and "Read History".

The screenshot displays the REALE software interface for test results. The main window shows a table of test results for GB/T1040 plastic tensile testing. The table has columns for test number, force, and displacement across different intervals. The right-hand panel contains various control buttons and a progress bar.

	005最大力 (kgf)	012第一区间的最大力	013第二区间的最大力	014第三区间的最大力	015第四区间的最大力	016第五区间的最大力
No.1	7.11	3.41	4.47	5.64	6.59	
No.2	7.42	4.53	5.63	6.77	7.38	
No.3	6.83	4.87	5.91	6.80	6.79	
No.4	7.05	0.00	0.00	1.92	4.71	
No.5	6.79	0.12	0.12	0.13	0.21	
No.6	0.00	-0.06	-0.07	-0.09	-0.09	
No.7	0.00	-0.11	-0.10	-0.09	-0.07	

- Export report to Excel : output the result to Excel file.
- Export report to Word : output the result to a text file.
- Export data source: export the data source of test results.

## 2.4. Menu

The menu introduction is shown in the table:

Main menu	First-level submenu	Explanation
Communication settings		Set COM port
Unit setting		Set the unit and accuracy of the test
Calibration settings		Set force sensor, stroke sensor, rubber extensometer (large deformation), calibration of system settings
language settings	Chinese	Set the language displayed by the software
	English	
Option settings	constant	Set the display screen at the start of the test. This function needs to be set before the test. It cannot be changed during the test. During the test, you can directly click the "pre-test settings", "force deformation" and other function keys on the screen to change the display screen.
	Setting items before testing	
	Curve 1	
	Curve 2	
	Curve 3	
	Test result item	
password setting		Set the user name and password when entering the system
help		Enter the TEMI Rally Machine User Manual
on		Set startup screen and desktop icons, etc.
drop out		Withdrawal from TEMI Rally Machine System

## 2.5. Edit style data

Click on the main interface button "Edit sample data" to enter the following figure:

[illegible]

- Name : set the sample name;
- Set the test number, area, width, outer diameter of the sample, area after breaking, standard moment after breaking, fillet radius, thickness, inner diameter;
- Add sample, delete sample;
- Confirm and exit: save the parameter and exit the interface;
- Cancel and exit: Cancel parameter saving and exit this interface.

## 2.6. Test method

Click "Edit Test Plan" in the main interface to enter the test plan setting interface, as shown in the following figure:

测试方案

测试方案列表  
橡胶拉伸测试  
塑料拉伸测试

名称: 橡胶拉伸测试

测试方法										控制参数			
步骤	测试方向	控制模式	控制值	切换条件	条件值	暂停时间	清零	后续处理	循环次数	后续处理			
1	向上	定速度	200.00 mm/min	时间>=	19.80 s	3.00 s	不清零	下一步	0	下一步			
2	向下	定速度	200.00 mm/min	时间>=	19.80 s	3.00 s	不清零	到第1步	1	结束			

增加  
删除  
保存并退出  
取消并退出

当力量>= 0.500 %量程时开始判断试样断裂  
当力量>= 0.000 %量程时开始判断试样变形  
☐ 试样断裂停机(停机保护)  
当瞬时力量衰减>= 0.000 %量程时开始判断试样断裂

待机  
☐ 使用预紧速度  
0.00 mm/min  
预紧力量: 0.800 %量程

Each test program includes: test direction, control mode, control value, switching condition, condition value, pause time, clearing, subsequent processing, cycle number, and subsequent processing.

① Test direction: the direction of the tension machine running when the software starts testing, up or down.

② Control mode: The machine operates in a certain mode, including: constant speed, constant deformation, constant force rate, constant force, constant stress rate, constant stress, constant strain rate, and constant strain. In step 1, only "constant speed", the control mode of other steps are arbitrarily selectable, for example: "positioning moving speed", the machine performs at a uniform speed with the speed value in the control value.

③ Control value: input the control value corresponding to the control mode.

④ Switching condition: when this condition is met, the machine will proceed to the next step. For example, "breakpoint" means that the current force is less than or equal to the percent of the maximum force, and the condition for switching to the next step is reached.

⑤ Condition value: Set the control value corresponding to the switching condition. When the condition is "breakpoint", it indicates the percentage of the maximum force; if the condition is "force  $\geq$ ", the condition value is force.



⑥ Pause time: indicates whether to pause for a period of time after reaching the condition.

⑦ Zero reset: indicates whether to perform zero reset action after the "pause time" is reached, including: non-zero reset, force zero reset, displacement zero reset, deformation zero reset, force and distortion zero reset, force and displacement zero reset, displacement And deformations are cleared and all are cleared.

⑧ Zero reset → follow-up processing: "End" indicates that the test is completed. "Next" means to continue to the next test. "Go to the next step" means to return to the first step loop for testing.

⑨ Cycle times: the number of cycle tests.

⑩ Number of cycles → follow-up processing: "End" indicates the completion of the test. "Next" means to continue to the next test.

The screenshot shows a control interface with the following elements:

- 当力量  $\geq$  0.500 %量程时开始判断试样断裂 (When strength  $\geq$  0.500 % range, start to judge specimen break)
- 当力量  $\geq$  0.000 %量程时开始判断试样变形 (When strength  $\geq$  0.000 % range, start to judge specimen deformation)
- ☐ 试样断裂停机(停机保护) (Specimen break shutdown (shutdown protection))
- 当瞬时力量衰减  $\geq$  0.000 %量程时开始判断试样断裂 (When instantaneous force attenuation  $\geq$  0.000 % range, start to judge specimen break)
- 待机** (Standby) section:
  - ☐ 使用预紧速度 (Use pre-tightening speed)
  - 0.00 mm/min
  - 预紧力量: 0.800 %量程 (Pre-tightening force: 0.800 % range)

- When the strength  $\geq$  □ % of the range, start to record the deformation;
- When the strength  $\geq$  □ % of the range, start to judge the break;
- Shutdown when the specimen breaks (shutdown protection);
- When the instantaneous power attenuation  $\geq$  □ % is judged as the sample breaking;

※ This condition is invalid when the switching condition of the step of the control scheme is "breakpoint". When the switching condition is selected as another mode, when the "strength  $\geq$  □ % range starts to judge the break", after the condition is met, the judgment "when the instantaneous power is attenuated"  $\geq$  □ % judges that the sample is broken" is satisfied, "when instantaneous force attenuation  $\geq$  □ % judges that the sample breaks" means the maximum force attenuation  $\geq$  □ % judges that the sample breaks, for example: the current range is 200kgf, when the force  $\geq$  It starts to judge the breakage when the range is 0.1%. The maximum force of the test is 5kgf. When the instantaneous power attenuation  $\geq$  20%, it is judged that the specimen is broken. When the force decays to 4kgf, it is judged as broken, and the system stops the test.

Standby

1. Preloading force: □% range;
2. Use preload speed.

※ When the preload force set value is not reached, it will run according to the preload speed set value, when the preload force reaches the set value, it will run according to the steps set by the test method.

## 2.7. Control parameters

Click "Control Parameters" in the control method interface to enter the test parameter setting interface, as shown in the following figure:

The screenshot shows the 'Control Parameters' interface for a 'Rubber Tensile Test' (橡胶拉伸测试). The interface is divided into several sections:

- Test Method List (测试方案列表):** A sidebar on the left with buttons for 'Add' (增加), 'Delete' (删除), 'Save and Exit' (保存并退出), and 'Cancel and Exit' (取消并退出).
- Name (名称):** A text field containing '橡胶拉伸测试'.
- Test Method (测试方法):** A tabbed interface with two main sections:
  - Sensor (传感器):**
    - Force (力): A dropdown menu set to '200kgf'.
    - Deformation (变形): Radio buttons for 'Displacement' (位移), 'Rubber Elongation Gauge' (橡胶伸长计), 'Metal Gauge' (金属引伸计), and 'Optical Detection' (光学检测). The 'Displacement' option is selected.
    - Gauge Switching Point (引伸计切换点): A text field set to '19.00 mm'.
  - Direction (方向):**
    - Force (力): Radio buttons for 'Reverse' (反向), 'Not Reverse' (不反向), and 'Take Absolute Value' (取绝对值). 'Not Reverse' is selected.
    - Displacement (位移): Radio buttons for 'Reverse' (反向), 'Not Reverse' (不反向), and 'Take Absolute Value' (取绝对值). 'Not Reverse' is selected.
    - Deformation (变形): Radio buttons for 'Reverse' (反向), 'Not Reverse' (不反向), and 'Take Absolute Value' (取绝对值). 'Not Reverse' is selected.
- Control Parameters (控制参数):**
  - Test Before Zeroing (测试前是否清零):** Checkboxes for 'Test Force Zeroing' (测试前力清零), 'Test Deformation Zeroing' (测试前变形清零), and 'Test Displacement Zeroing' (测试前位移清零). All are checked.
  - Test After Settings (测试后设置):**
    - Test After Auto Return (测试后自动回位): A checkbox, currently unchecked.
    - Return to Zero Point (回到零点): A radio button, currently selected.
    - Test After Auto Display Multiple Test Data (测试后自动显示多组测试数据): A checked checkbox.
    - Test After弹出断后标距及面积输入框 (测试后弹出断后标距及面积输入框): A checkbox, currently unchecked.
  - Protection (保护):**
    - Exceed Force (超过力量): A checkbox, currently unchecked. Value: 50 %量程.
    - Exceed Displacement (超过位移): A checkbox, currently unchecked. Value: 10.00 mm.
    - Exceed Deformation (超过变形): A checkbox, currently unchecked. Value: 10.00 mm.

## Settings

1. Selection of force: Range selection of force sensor
2. Deformation:

- Displacement: when displacement is selected as displacement, displacement sensor is selected for extension.
- Extensometer: elongation is the data value of rubber extensometer. If the machine is not connected with rubber extensometer, please do not select this option, otherwise the elongation will be 0 .
- Extensometer: The elongation is the data value of the metal extensometer. If the machine is not connected to a metal extensometer, please do not select this option, otherwise the elongation will be 0 .
- Optical monitoring: when optical monitoring is selected, the extensometer switching point can be set:
- Direction
- Reverse the initial display value.
- Not reversed: The displayed value is not reversed.
- Take the absolute value.
- Whether to clear before testing
- Force reset before testing
- Deformation reset before testing



- Zero displacement before testing
- Set after test
- Automatic return after testing
- display multiple sets of test data after testing
- testing, the input box for area and gauge length after break will pop up
- protection
- power
- displacement
- than deformation
- Sensor settings

3. Selection of force: range selection of force sensor

4. Deformation:

- Displacement: when displacement is selected as displacement, displacement sensor is selected for extension.

- wxtensometer: elongation is the data value of rubber extensometer. If the machine is not connected with rubber extensometer, please do not select this option, otherwise the elongation will be 0 .
- Extensometer: The elongation is the data value of the metal extensometer. If the machine is not connected to a metal extensometer, please do not select this option, otherwise the elongation will be 0 .
- Optical monitoring: when optical monitoring is selected, the extensometer switching point can be set:
- Direction
- Reverse : Reverse the initial display value.
- Not reversed: The displayed value is not reversed.
- Take the absolute value.
- Whether to clear before testing
- Force reset before testing
- Deformation reset before testing
- Zero displacement before testing
- Set after test

- Automatic return after testing
- Automatically display multiple sets of test data after testing
- After testing, the input box for area and gauge length after break will pop up
- protection
- Exceed the power
- Exceed displacement
- More than deformation

## **2.8. Test result setting**

Click "Edit" in the test result interface to enter the test result setting, as shown in the figure below:

TEMI201 (C) ----- 已联机

通信设置 单位设置 校准设置 语言设置 选项设置 密码设置 帮助 关于 退出

试验状态

测试停止

试验时间  
00:00:04:15

力 kgf  
0.02

位移 mm  
14.69

变形 mm  
14.69

最大力 kgf  
0.02

清零

测试前设置 力-变形 力-时间 变形-时间 测试结果

测试结果选择 GB/T1040塑料拉伸性能测试 编辑

	005最大力 (kgf)	012第一区间的最大力	013第二区间的最大力	014第三区间的最大力	015第四区间的最大力	016第五区间的最大力
No.1	0.00	0.00	0.00	0.00	0.00	0.00
No.2	0.00	0.00	0.00	0.00	0.00	0.00
No.3	0.00	0.00	0.00	0.00	0.00	0.00
No.4	0.00	0.00	0.00	0.00	0.00	0.00

清除数据 重新计算 删除指定记录 保存指定记录 读取历史记录

报表默认路径 C:\Documents and Settings\hp\桌面 更改路径

报表图形选择 ☐ 力-变形 ☒ 力-时间 ☐ 变形-时间 编辑报表

输出报表(Excel) 输出报表(Word) 导出数据源 打印(Excel) 打印(Word)

在曲线上标示

☒ 第一区间 ☒ 第二区间 ☒ 第三区间 ☒ 第四区间 ☒ 第五区间 ☒ 剥离区间

开始测试 结束测试 继续测试

速度 300.34 mm/min 上升 下降 停止

回位速度 150 mm/min 回位

慢速 50.1 mm/min 慢上 慢下

微速 20 mm/min 微上 微下

寸动距离 0 mm 寸动上升 寸动下降

V3.4.4

测试结果

名称列表

GB/T1040塑料拉伸性能测试  
GB/T1041塑料压缩性能测试  
GB/T9341塑料弯曲性能测试  
GB/T9647热塑性管材环刚度测定  
GB/T8804热塑性管材拉伸性能测试  
GB/T228金属室温拉伸试验  
GB/T6400金属室温压缩试验  
GB/T14452金属弯曲性能测试  
GB/T6400金属线材扭转剪切试验

名称 GB/T1040塑料拉伸性能测试

增加 删除

测试结果 区间设置 自动取点设置 其它

005最大力  
012第一区间的最大力  
013第二区间的最大力  
014第三区间的最大力  
015第四区间的最大力  
016第五区间的最大力  
858剥离区间最大力  
006最大力点的变形  
001测试速度  
002测试时间  
011杨氏弹性模量  
747抗拉强度  
749最大力伸长率  
763断裂力

加入 删除 清空 查找

001测试速度  
002测试时间  
003最小力  
004最小力点的变形  
005最大力  
006最大力点的变形  
007上屈服点的力量  
008上屈服点的变形  
009下屈服点的力量  
010下屈服点的变形  
011杨氏弹性模量  
012第一区间的最大力  
013第二区间的最大力  
014第三区间的最大力  
015第四区间的最大力  
016第五区间的最大力  
017第一区间的最大力  
018第二区间的最大力  
019第三区间的最大力  
020第四区间的最大力  
021第五区间的最大力  
022第一区间的平均力  
023第二区间的平均力  
024第三区间的平均力  
025第四区间的平均力  
026第五区间的平均力  
027定力量取点1的力量  
028定力量取点2的力量  
029定力量取点3的力量  
030定力量取点4的力量  
031定力量取点5的力量  
032定力量取点6的力量

增加 删除 编辑 删除 最前 最后

确定 取消



## 2.10. Automatic fetch point setting

In the above interface, click "Automatic point setting" to enter the automatic point selection interface, as shown in the following figure:



- Automatic point-taking mode: time, deformation, force, stress, percentage of maximum force, elongation.
- When the automatic point-taking mode is selected as a certain mode, the deformation, force, stress, percentage of maximum force, and elongation will be automatically set according to the list.

## 2.11. Other settings

Click "Other" in the above interface to enter other settings interface, as shown in the figure below:

**测试结果**

名称列表

- GB/T1040塑料拉伸性能测试
- GB/T1041塑料压缩性能测试
- GB/T9341塑料弯曲性能测试
- GB/T9647热塑性管材环刚度测定
- GB/T8804热塑性管材拉伸性能测试
- GB/T228金属室温拉伸试验
- GB/T6400金属室压缩试验
- GB/T14452金属弯曲性能测试
- GB/T6400金属线材铆钉剪切试验

名称: GB/T1040塑料拉伸性能测试

增加 删除

测试结果 区间设置 自动取点设置 其它

杨氏弹性模量

☒ 以最大力参考  
☐ 以标距为参考

第一点 10 %的最大力  
第二点 40 %的最大力

第一点 10 %的标距  
第二点 40 %的标距

弹性段落标志点

第一点 5 %的最大力  
第二点 30 %的最大力

屈服点

屈服点起始力: 10 %的最大力  
落差力: 0.98 kgf

第一规定非比例延伸点

从 15 %的最大力  
到 45 %的最大力  
偏移量 0.2 %的标距

第二规定非比例延伸点

从 15 %的最大力  
到 45 %的最大力  
偏移量 0.5 %的标距

资料统计

☐ 最大值 ☐ 最小值 ☐ 平均值

确定 取消

- Young 's modulus of elasticity
- Reference with maximum force
- Take standard moment as reference
- Flexible paragraph mark points
- The first point
- Second point
- Yield point
- Yield initial force, drop force setting.
- The first specified non-proportional extension point
- Second specified force of non-proportional extension point
- Data statistics
- Maximum value
- minimum
- the average

## 2.12. Unit settings

The unit setting is shown below:

	单位	精度		单位	精度
力:	kgf	2	力速率:	kgf/min	2
长度:	mm	2	应力速率:	kgf/mm <sup>2</sup> /min	2
时间:	s	2	应变速率:	%/min	2
应力:	MPa	2			
力/长度:	kgf/mm	2			
速度:	mm/min	2			
面积:	mm <sup>2</sup>	2			
能量:	kgf.mm	2			

This contains all the unit settings of the system, and the precision indicates a few digits after the decimal point.

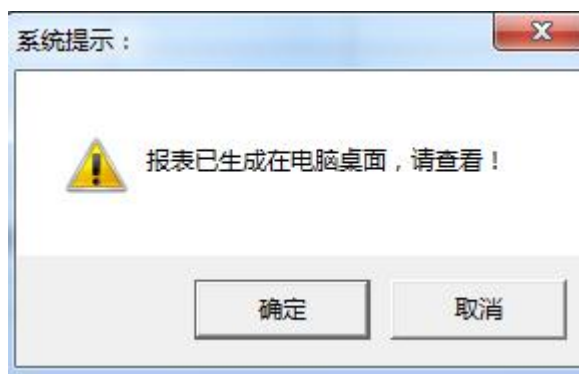
## 2.13. Report

The report output is shown below:

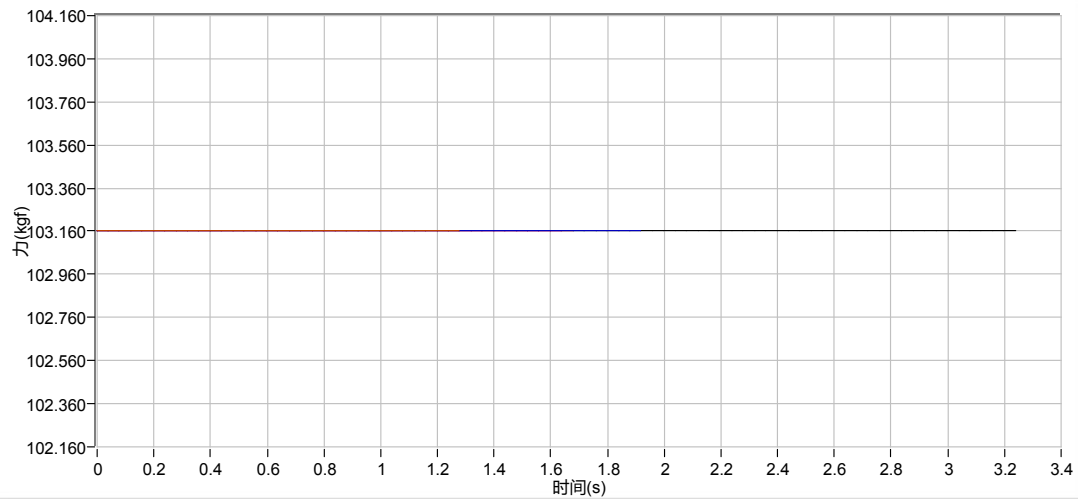




- Output report ( EXCEL ) : Output the current report to Excel format.
- Output report ( WORD ) : Output the current report to Word format.
- Report graphic selection : Select which graphic appears in the report.
- Mark on the curve : maximum force point, minimum force point, first interval, second interval, third interval, fourth interval, fifth interval, and stripping interval.
- Successful report output

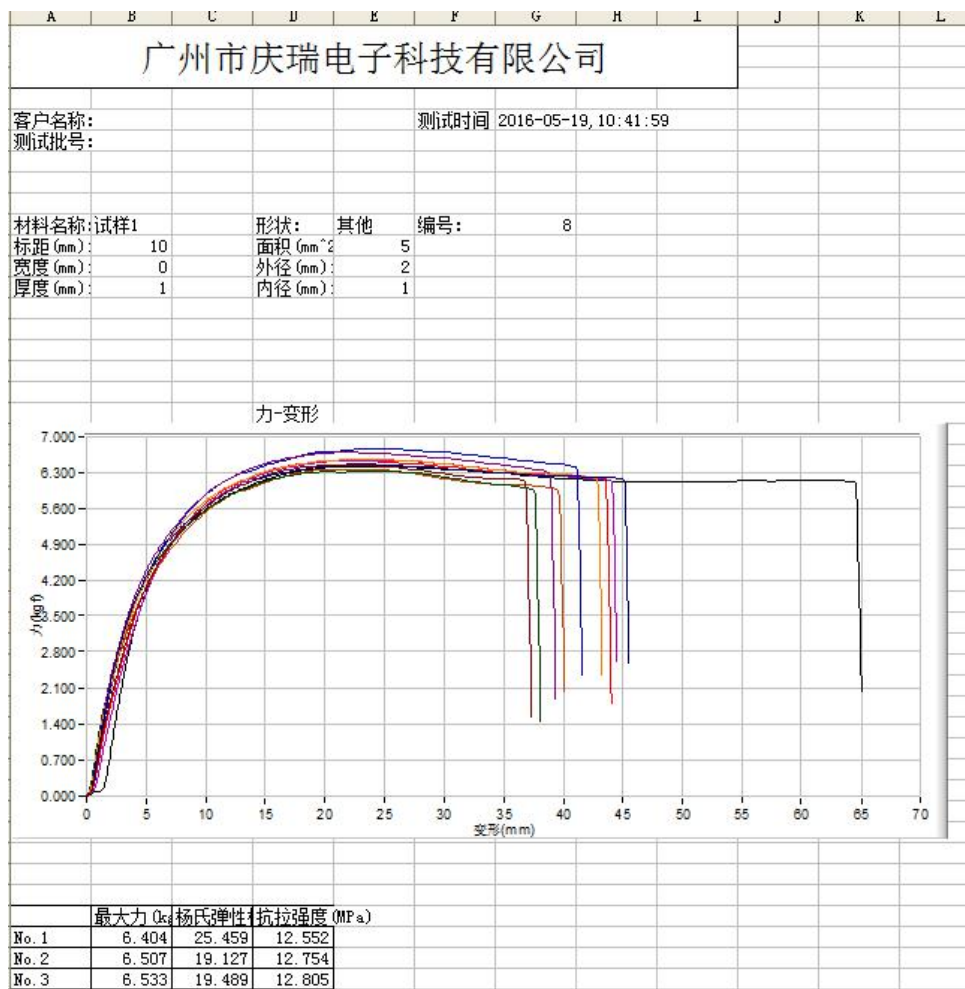


### 2.13.1. WORD report style



	最大力 (kgf)	杨氏弹性模量 (MPa)	抗拉强度 (MPa)	第四区间的最大力 (kgf)	第四区间的最小力 (kgf)	最大力点的变形 (mm)
No.1	103.16	0.00	126.37	103.16	103.16	0.08
No.2	103.16	0.00	126.37	103.16	103.16	0.08
No.3	103.16	0.00	126.37	103.16	103.16	0.08
No.4	103.16	0.00	126.37	103.16	103.16	0.08
No.5	103.16	0.00	126.37	103.16	103.16	0.08
最大值	103.160	0.000	126.370	103.160	103.160	0.080
最小值	103.160	0.000	126.370	103.160	103.160	0.080
平均值	103.160	0.000	126.370	103.160	103.160	0.080
	上屈服点的变形 (mm)	下屈服点的力量 (kgf)	下屈服点的变形 (mm)	第二区间的最大力 (kgf)		
No.1	0.08	103.16	0.08	103.16		
No.2	0.08	103.16	0.08	103.16		
No.3	0.08	103.16	0.08	103.16		
No.4	0.08	103.16	0.08	103.16		
No.5	0.08	103.16	0.08	103.16		
最大值	0.080	103.160	0.080	103.160		
最小值	0.080	103.160	0.080	103.160		
平均值	0.080	103.160	0.080	103.160		

## 2.13.2. EXCEL report style



## 2.14. Edit report

Click "Edit Report" in the following interface to edit report format.



## 2.14.1. Edit report format



## 2.15. Calibration

Select "Calibration Settings " on the toolbar , and a password input interface will pop up, as shown in the figure:



After entering the correct password, the default password is 0 , you can enter the calibration interface. Calibration includes calibration of force, displacement, deformation, speed and other settings. The following will introduce them one by one.

### 2.15.1. Calibration of force sensors

The calibration of the force sensor is shown below:



When the machine and the computer are connected normally and the force sensor is normal, the AD value will have a three-digit jump that can be judged as normal.

The general steps of calibration are as follows:

1. Click "Clear" on the right;
2. In the case of no load, enter 0 for "standard weight value" and click "take point";
3. Hang the weight, such as 10kg , enter 10 for the "standard weight value" (note the conversion relationship of the unit here), click "take point"; hang the weight in order from small to large, and repeat this step;

4. Click "Write calibration parameters to acquisition card" in the toolbar, and prompt "success";
5. In the case of no load, the force is reset to zero, and the weight is put on for verification.

The calibration process is as follows:

1. Select the Force Sensor tab, as shown above. There are four force sensor channels shown on the left: " 200kg ", "0kg", "0kg", "0kg" (range can be set).
2. Plug in the force sensor to be calibrated, such as a force sensor with a range of 50 kg , and select a force sensor channel on the left;
3. Enter the range of the sensor in the "Range" input box, such as " 50" kg;
4. Enter the zero value force of the sensor in the "zero value" input box, generally enter " 0" ;
5. Click the "Empty" button to clear the calibration table;
6. Calibration point 1: Empty the sensor, and enter " 0" kg in the input box to the right of the "standard weight value" , and then click the "take point" button, the AD value of the first point and the standard weight value are Take in the calibration table;
7. Calibration point 2: Load the sensor with a certain value of load, such as hanging a 5kg weight, and enter the load value " 5" kg in the input box to the right of "standard weight value" , and then click the



"take point" button, Then "write the calibration parameters to the acquisition card", the AD value and the standard weight value at point 2 are taken into the calibration table;

8. Calibration point 3: The method is the same as the second point. If you continue to calibrate the third point, the "AD value" and "standard weight value" can only be greater than the second point, otherwise the calibration will be inaccurate;

9. Calibration point 4: The method is the same as point 2. If you continue to calibrate point 4, the "AD value" and "standard weight value" can only be greater than the third point, otherwise the calibration will be inaccurate;

10. Calibration point 5: The method is the same as point 2. If you continue to calibrate point 5, the "AD value" and "standard weight value" can only be greater than the fourth point, otherwise the calibration will be inaccurate;

11. Calibration point 6: The method is the same as point 2. If you continue to calibrate point 6, the "AD value" and "standard weight value" can only be greater than the fifth point, otherwise the calibration will be inaccurate;

12. Click the "Write Calibration Data to Acquisition Card" button. If "Write Successful" is prompted, complete the calibration of a force sensor. If "Write Failed" is prompted, please try again.



13. If you need to connect a second force sensor, repeat steps 1 to 11 above, otherwise set all other sensors' ranges to 0, and then click the "Write calibration parameters to acquisition card" button.

14. Note: At least 2 points should be calibrated. Steps 7 to 10 can be omitted. According to the characteristics of most domestic sensors, three-point calibration can generally achieve very good accuracy. The second point generally takes 3 to 5% of the sensor range, and the third point generally takes 30 to 50% of the sensor range. . If you calibrate more than 3 points (including 3 points), you must ensure that the "AD value" and "standard weight value" of the latter point must be greater than the previous point, otherwise the calibration will be inaccurate. If the "standard value" increases and the "AD value" becomes smaller, you can increase it by swapping the two signal wires of the force sensor. The "AD value" is generally about 8400000 when it is not loaded, and the "AD value" changes proportionally when the sensor is loaded. If the "AD value" does not change when loading, it means that the hardware is not working properly, it may be that the force sensor is damaged or the acquisition card has Failure, please contact the manufacturer for replacement.

15. If there is a slight difference between the measured force value and the standard weight after calibration, it can be solved by recalibrating once, or it can be achieved by directly modifying the standard weight value data

in the calibration table, such as the software measured value is higher than the standard weight. If the value is large, you can change the standard weight value of the second point in the calibration table to a smaller value, and then click the "Write calibration data to the acquisition card" button, and then clear the comparison again until the two values are approximately equal.

### 2.15.2. Calibration of stroke sensor

The calibration of the stroke sensor is shown below:



When calibrating the travel sensor, first perform "zeroing", the principle is the same as "calibration of force sensor", and the calibration procedure can be directly referred to.

Proceed as follows:

1. Click the "Clear" button on the right;
2. Let the machine run up or down for a distance;
3. Measure the distance traveled by the machine, enter the stroke value in the box to the right of "Enter stroke" (note the unit conversion relationship here) and click "OK";
4. Click the "Write calibration parameters to acquisition card" button, prompt "success", the calibration is completed.

### **2.15.3. Calibration of rubber extensometer**

The calibration is shown below:

校准

力传感器	行程传感器	橡胶伸长计(大变形)	系统设置
<div>输入变形: <input type="text" value="0.00"/> mm <input type="button" value="确定"/></div> <div>当前变形: <input type="text" value="14.69"/> mm</div> <div>变形频率: <input type="text" value="0"/></div> <div>变形系数: <input type="text" value="359.0000"/></div>			

上升

下降

停止

清零

500  
400  
300  
200  
100  
0

mm/min

退出

从采集卡读取校准参数

将校准参数写入采集卡

从电脑里读取校准参数

将校准参数写入电脑

The calibration method is the same as "Stroke Sensor".

#### 2.15.4. System settings



**The maximum speed of the system :** to limit the maximum speed of the machine operation (unit: switchable);

**The minimum speed of the system :** the **minimum speed** to limit the operation of the machine (unit: switchable);

**Ascent and descent speed:** the machine's ascent or descent speed (unit: switchable);

**Up and down direction reverse:** In the case of incorrect up and down direction, you can check this option;

**Reverse stretch and compression direction:** check this option if the stretch and compression direction is incorrect;

**Reverse direction of return : reverse direction of return;**

**Speed calibration steps:**

**Servo calibration:**

Note: ① such as when the need for calibration, first click on the "Clear", " Clear " enter "calibration speed" and "calibration time" then click "Start calibration", calibration out of value (current displacement) accurate to Then click "Write calibration parameters to the control board", and then click "Read calibration parameters from the control board" After reading the parameters, you can exit the calibration interface (the direction of rise and fall is consistent with the test direction).

- ② If the calibration value (current displacement) is inaccurate, click "Calculate Coefficient", click "Write Calibration Parameters to Control Panel", then repeat the steps of No. 1 to calibrate again, and click "Write Calibration Parameters to Control Panel" after calibration, and then click "read calibration parameters from the control board", after the calibration parameters are read, you can exit the calibration.
- ③ This calibration can be repeated until the calibration value is the most accurate.



Proceed as follows:

- ① First, "read calibration parameters from the acquisition card", enter the value of "lowest duty cycle" into "duty cycle" and click "OK", then use a multimeter to measure the drive terminals of the inverter of the circuit board, RET+, 0V two pins, If the voltage = 0.28 ~ 0.29V, enter "duty cycle" into "minimum duty cycle";
- ② Enter the "highest duty cycle" into "duty cycle" and click

"OK", use a multimeter to measure the drive terminals of the inverter of the circuit board, RET+, 0V two pins, if the voltage = 4.48 ~ 4.49V, put the "duty cycle" " Enter "Maximum Duty Cycle" ;

③ Complete the above ①②Step "Write standard parameters to acquisition card", then click "Read standard parameters from acquisition card" to see if the parameters are saved to the acquisition card and exit the calibration interface;

④ Return to the main interface, enter the "Edit Control Plan" interface as shown in the figure below, enter the speed in the "Control Value", the control speed of the inverter is 0 ~ 150mm/min, set the time "save and exit" the interface returns to the main interface.

测试方案

名称: 橡胶拉伸测试

测试方案列表

- 橡胶拉伸测试
- 塑料拉伸测试

增加

删除

保存并退出

取消并退出

测试方法

步骤	测试方向	控制模式	控制值	切换条件	条件值	暂停时间	清零	后续处理	循环次数	后续处理		
1	向上	定速度	200.00	时间 >=	19.80	s	3.00	s	不清零	下一步	0	下一步
2	向下	定速度	200.00	时间 >=	19.80	s	3.00	s	不清零	到第1步	1	结束

当力量 >= 0.500 %量程时开始判断试样断裂

当力量 >= 0.000 %量程时开始判断试样变形

☐ 试样断裂停机(停机保护)

当前力量 >= 0.000 %量程时开始判断试样断裂

待机

☐ 使用预紧速度

0.00 mm/min

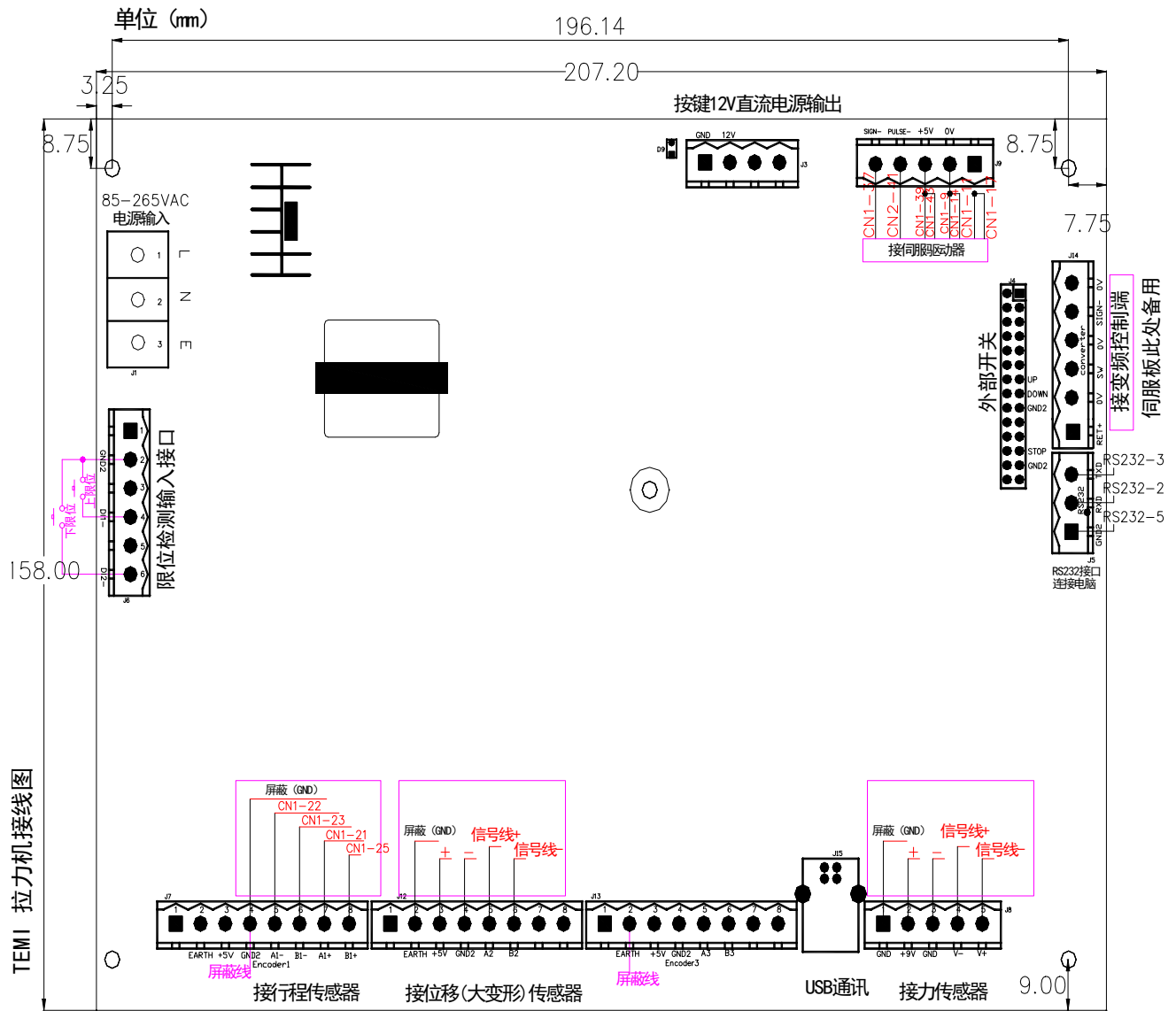
预紧力量: 0.800 %量程

⑤ Before starting the test, "zero" the channel value, record the starting point of the operation on the machine, and after the test is completed, read the displacement of the second channel and measure the distance between the start with a vernier caliper.

⑥ Use the above steps to repeatedly verify the "speed" of the inverter.



### 3. Appendix: Wiring diagram



## External switch wiring diagram

