Tearing Tester

TGT-01

Operation Manual



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Preface

About This Guide

This manual contains a description of the operation and maintenance of TGT-01 Tearing Tester.

Safety Precautions

Observe the following safety precautions when operating or performing service：

Power supply MUST be AC 220V 50 Hz, and should be grounded.

This instrument SHOULD NOT be operated in high humidity (over 70% RH), intensely corrosive, combustible, explosive, or similar environment, or under intensive vibration or strong electromagnetic interference.

The specimen must be replaced in each test no matter the test is finished naturally or interrupted.

Do not dismantle this instrument without authorization

Turn off the power after test and cover the instrument with a dustproof cloth.

Extreme care should be taken to avoid potential injuries by the cutter.

Balance the instrument before test. Label the test side and direction of the specimen.

Overloading operation is prohibited. Select a proper pendulum weight.

The calibration weight should be held with hand when the pendulum is lifted to latch position.

1. Introduction

Tearing Tester is designed for the determination of the average force to propagate tearing through a specified length of plastic film or nonrigid sheeting after the tear has been started.

Standards:

ASTM D1922, ASTM D1424, ASTM D689, ISO 6383, ISO 1974, GB/T16578.2-2009, GB/T 455,

1.1. Principle

A pendulum of known weight is lifted to a specified height and a test specimen is clamped and precut with a specimen holder and cutter, respectively. The pendulum is released to tear the specimen from which the energy loss is used for the calculation of the tearing force.

1.2. Specifications

Model	TGT-01 Tearing Tester
Pendulum Capacity	6400 gf
Gas Source	0.6 MPa
Tearing Arm	104±1mm
Tearing Initial Angle	27.5 ±0.5°
Power	AC 220V 50Hz

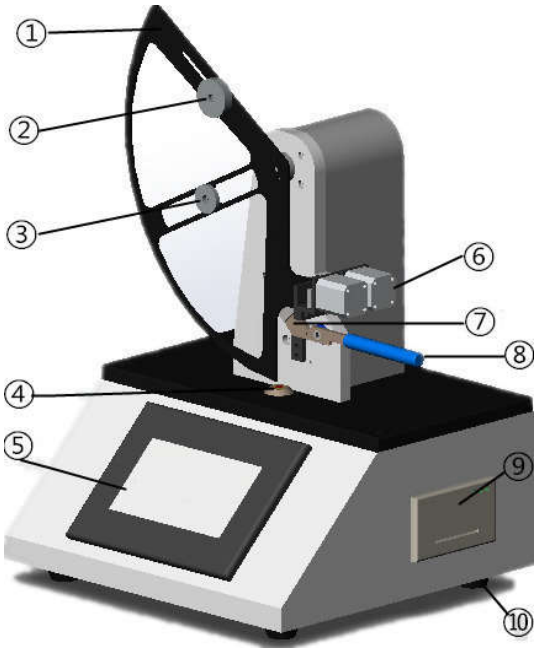
1.3. Unpacking

Remove the instrument from the shipping carton and inspect for any signs of damage. Contact the delivery agent immediately if any damage observed. Leave the instrument in the shipping carton for the delivery agent to examine the damage.

The instrument is shipped in a special designed box to prevent damage. If re-shipment is necessary, the instrument should be repacked in the original box. Please save the box properly.

2. Instrument

2.1. Instrument Description



TGT-01 System

① Pendulum: A bare pendulum together with additional weights to provide tearing force

② Balance weight: To balance the pendulum (DO NOT loose the balance weight only if it's needed in 2.2.5.)

③ Additional weight: To extend test range of pendulum

④ Pendulum latch: To hold or release the pendulum

⑤ Touch screen: To set parameter and operate

⑥ Specimen Clamp: Air-operated specimen clamp with a stationary part and a movable part on the pendulum

⑦ Cutter: To precut a slit of 20±0.5 mm on the specimen

⑧ Cutter handle

⑨ Mircoprinter: To print result

⑩ Base: to hold the tester

2.2. Installation

2.2.1. Important notice before installation

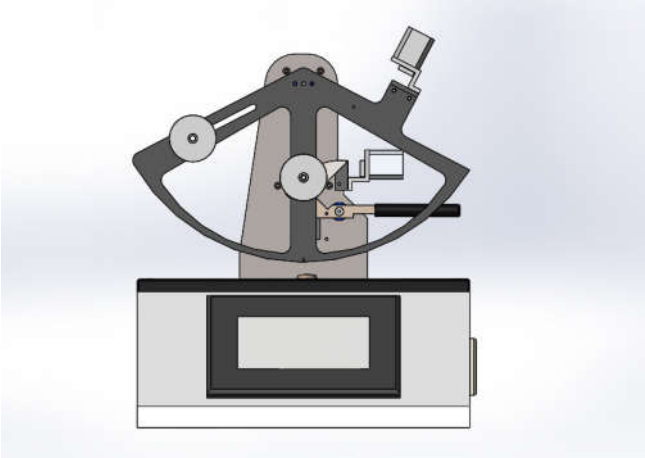
- The system should be placed with enough space to allow installation and operation.
- The instrument should not be operated under strong electromagnetic interferences and with other high-power electrical appliances
- The power supply should be AC 220V 50 Hz, and well grounded.
- Operating personnel should perform the test according to this instruction manual.
- Place the instrument on a steady table with at least 0.5 m surrounding for installation.
- There should be no wind and no obvious gas flow around the instrument. Environment temperature of 23±1℃ is required. And the relative humidity of environment should be 50±5%RH.

Please read the complete manual before plug in AC 220V 50 Hz power supply.

2.2.2. Take out the tester mainframe and wooden box from the carton.

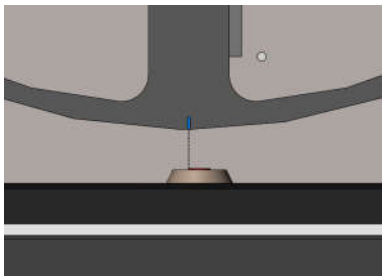
2.2.3. Set the tester upright on a steady table or work bench. Adjust the four foot screw to find the horizontal position with help of the level bubble.

2.2.4. Take out the pendulum from the wooden box and install on the bearing axis with M4 bolts, as indicated below.

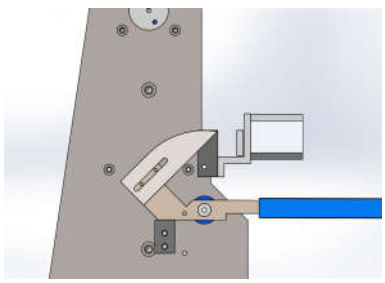


Pendulum Installation Completes

2.2.5. When the pendulum is installed, make sure the notch in the middle of sector is vertical with left side of the latch. If not, loose balance weight and adjust its position until the below position is found.

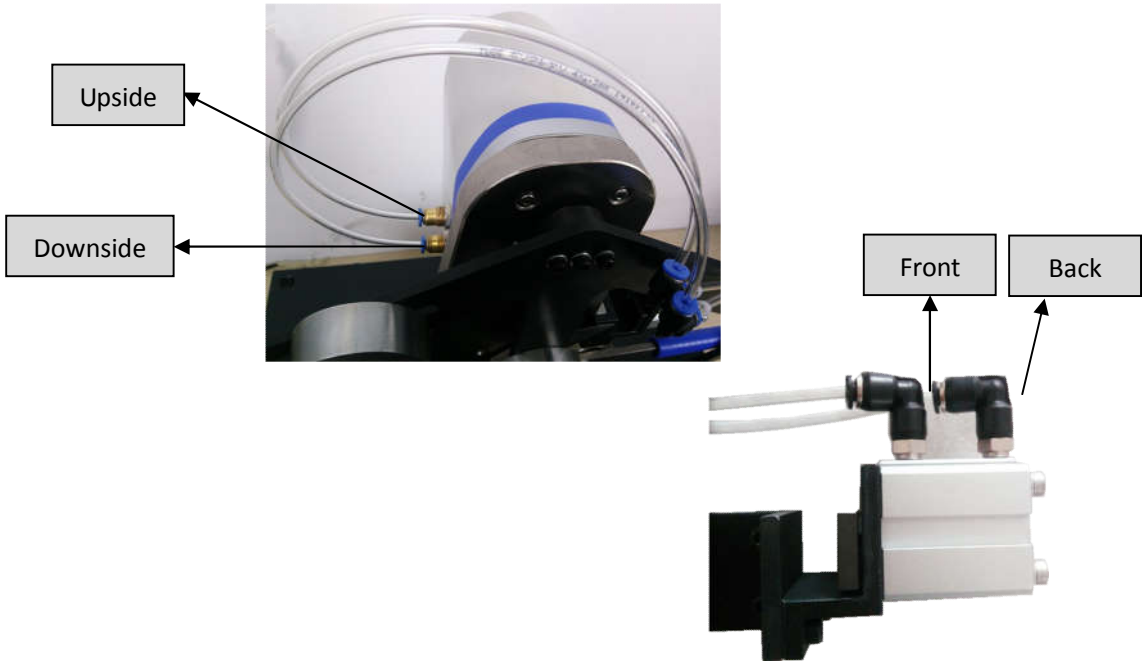


2.2.6. Cutter adjustment. Make sure the precut slit of the specimen by the cutter is 20±0.5 mm.



2.2.7. Connect the gas source to the gas port at back hood with a Φ 6 gas tube.

2.2.8. Connect the gas source to the specimen clamp with the mainframe with two Φ4 gas tubes, as indicated below.



Upside to Front; Downside to Back

2.2.9. Connect to power with power cable.

2.2.10. After all the above procedures have been done, turn on the tester.

3. Operation

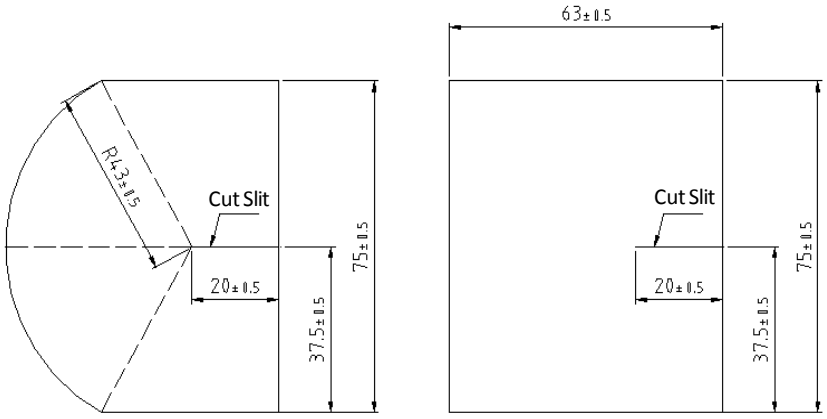
3.1. Specimen

①. Prepare Specimen

Prepare a certain number of specimens according to the requirement of test. Check to make sure there are no obvious defects on the specimen. The number of specimen should be no less than 3.

②. Specimen shape

Two types of specimens can be tested: constant-radius and rectangular, specifications as below.



(Unit: mm)

③. Pretreatment of Specimen

Unless there is other specification on conditioning time and environment of specimen, the specimen should be kept for at least 72 hours at temperature of 23±1℃ and relative humidity of 50±5%RH.

3.2. Test Process

①. Power on the instruments and prepare the conditioned specimen at hand.

②. Observe the balance of the tester. Make sure the ….

③. Lift the pendulum and the latch automatically lifts and latches it. Make sure the pendulum and the latch is gently contacted.

NOTE: Make sure the finger, hand or any hard object is in the specimen clamp motion range to avoid its damage or jammed finger risk.

④. Load test specimens and do test. (Refer to part 3.3.)

⑤. Do calibration if needed. (Refer to part 4.)

⑥. Finish all the tests needed.

⑦. Remove the specimen, and turn off power supply and gas source of instrument. Cover the instrument with dust-proof cloth. Keep the cloth clean from any dust.

3.3. Human-computer Interface Operation

All parameter settings, calibration and operation are done by the touching screen. The following is the explanation of different interfaces.

①. Power on

When powered on, the screen will first show the logo of Leading Instruments and then the system goes through the self-test test. During this period, AVOID any touching operation on the screen until the system goes to the standby mode.

②. Standby

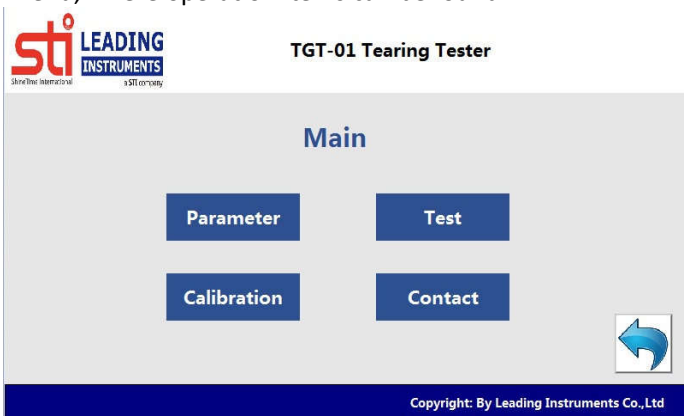
Standby mode after system power-on self-test.



Standby Interface

③. Main Menu

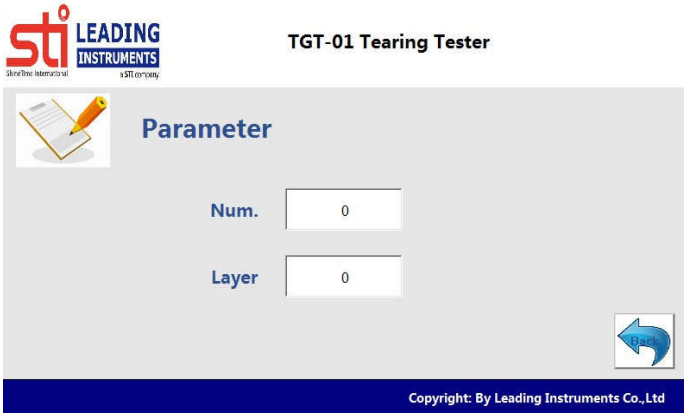
Press  to enter Main Menu, where operation items can be found.



Main Menu

④. Parameters

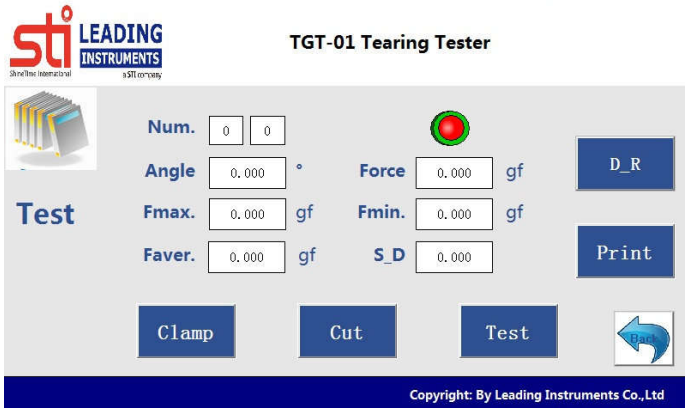
The user can set parameters (test numbers and layers of specimen) in the following interface. Press the white rectangular section and input test number by the floating keyboard.



Parameter Setting

⑤. Test

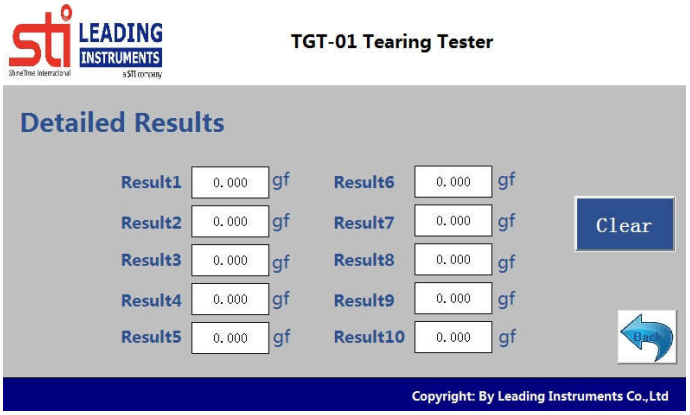
After parameters are set, press  button at bottom right to enter the main interface, from where click  button to enter 'Test 'section.



Test Interface

Terms:
Num.: Total number of group tests and on-going test sequence.
Angle: the maximum lifting angle of the on-going test.
Fmax.: the maximum force of all the tests finished.
Faver.: the average force of all the tests finished.
Force: the force of on-going test.
Fmin: the minimum force of all the tests finished.
S_D: standard deviation.

D_R: data record of the recently finished 10 tests, the interface of which is as below.



Data Record

Print: to print result of a single or group test.

Clamp: to clamp specimen.

Cut: to slit the specimen before test. The test can't be initiated if this button is not pressed.

Test: to start a test.

: to return to previous menu.

- Set the pendulum to its latched position. Place the test specimen in specimen holder with the right tearing direction. After the specimen is loaded, press Clamp button to clamp the specimen. Then slit the specimen with cutter. Press Cut button to conform the specimen cutting operation. The indication button of will turn from red to green.
- Press Test button to initial a test.

NOTE:

- If the Cut button is not pressed after cutting, the test will not start even if the Test button is pressed.
- During the first swing of the pendulum, do not attempt to touch or stop the pendulum to avoid result mistakes and possible danger.
- Catch and return the pendulum when it is still or slowed down.

- Press Print button to print result of a single test or a group test.
- Change to a new specimen(s) and do another test(s).

4. Calibration

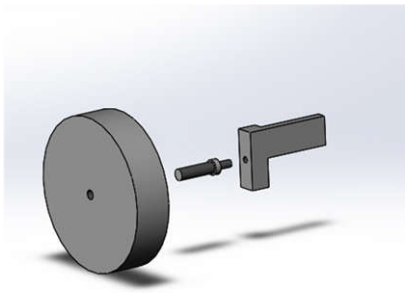
NOTICE: The calibration of the instrument is completed before shipment. Do not alter the parameters of calibration, or this alteration may lead to incorrect test results. However, it is helpful for the operator to understand the calibration process.

- *Enter the calibration interface from the main menu.*
- *The password for entering calibration is "555".*
- *Only perform calibration operation when it's necessary.*

If there are any questions, please contact us immediately via email or phone call.

4.1. Preparation

①. Prepare 3217g calibration weight to perform calibration. Connect the following three parts of the calibration weight.



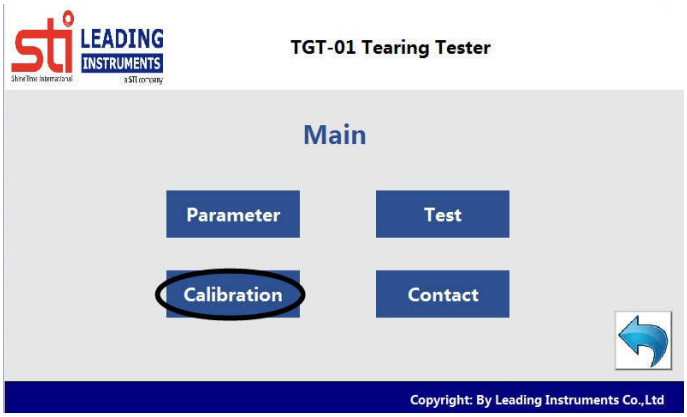
Calibration Weight

②. Level and balance the instrument;

③. Go to procedure 4.2..

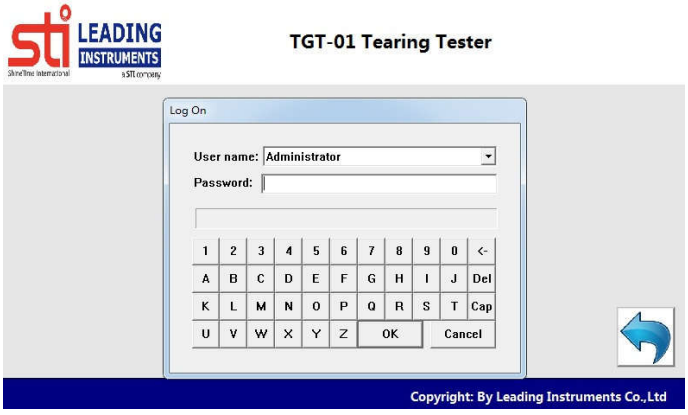
4.2. Calibration Procedure

①. Power on and press **Calibration** from the main menu.



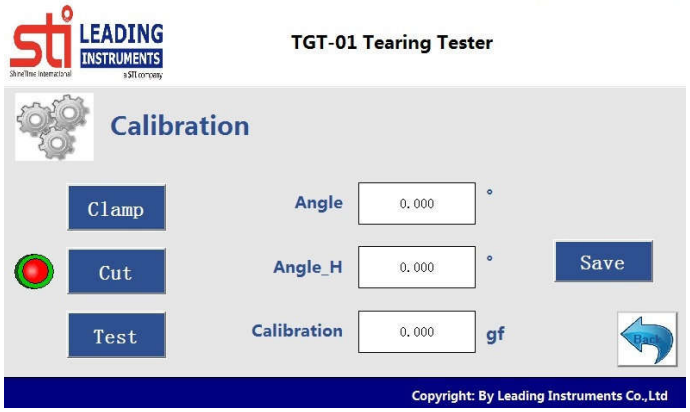
Calibration Interface

②. Input the passwords by the floating keyboard.



Password Input for Calibration: 555

③. Enter the calibration menu.



Calibration Menu

Terms:

Angle: The real time display of the angle of pendulum position. When the pendulum is not latched and still, the angle should be 62.5 degree (as the position in 2.2.4. and 2.2.5.). When the pendulum is lift, the value for Angle should be within 0.3 degree, otherwise, adjust the M4 bolts, as in 2.2.4.

Angle_H: The maximum angle the pendulum can lift.

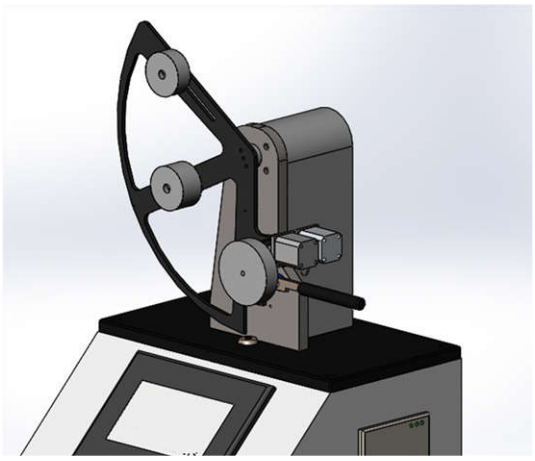
Calibration: The force of with or without calibration weight. When the Angle_H is found, its value should be 0gf without the calibration weight, or 3217gf with the calibration weight.

Note: A calibration error may occur as when it's not exactly 0gf or 3217gf, make sure the calibration value is within the 0.5% of the 6400gf test range or within the acceptance degree of user.

④. First lift and latch the pendulum. Do a complete test procedure (i.e. Press Clamp, Cut and Test button successively) without specimen and calibration weight.
The Angle_H will be recorded and the calibration valuable will be 0gf or near 0gf.

⑤. Press Save button to record the Angle_H.

⑥. Check by the calibration weight.
Lift and latch the pendulum, clamp the calibration weight to the movable specimen clamp and do a test. The calibration value should be 3217gf or within the 0.5% of the 6400gf test range or within the acceptance degree of user.



Clamp Calibration Weight with Movable Specimen Clamp

NOTE:

⚠⚠⚠ **When the calibration weight is still clamped, hold it with hand when lifting the pendulum to its latched position**, as the clamp automatically returns when the pendulum is latched. Failure to hold it may cause the calibration weight to drop when the pendulum is lifted and latched.

⑦. Press  to exit the calibration.

5. Maintenance

5.1. General Maintenance

- Read the instruction manual thoroughly before any operation.
- Power supply must be AC 220V 50Hz, and should be grounded.
- Do not disassemble the instrument without authorization.
- Do not dismantle without authorization

- Turn off power after test and cover the instrument with a dustproof cloth.
- Avoid pendulum to collide with any hard object during or not during a test.

5.2. Technical Support

The contact information when technical support is needed can be reached from Main Menu **Contact** button.



Contact Information

NOTICE:

Before you call us for help, please make sure:

- Read the Instruction Manual thoroughly and check all possible problems;
- Place instrument and Instruction Manual at hand;
- Prepare the following information: Model, purchase date and manufacturing code.

Leading Instruments Co.,Ltd.

Huashan Town, Jinan, P.R.China

Tel：0086 531 58668976

Fax：0086 531 67884556

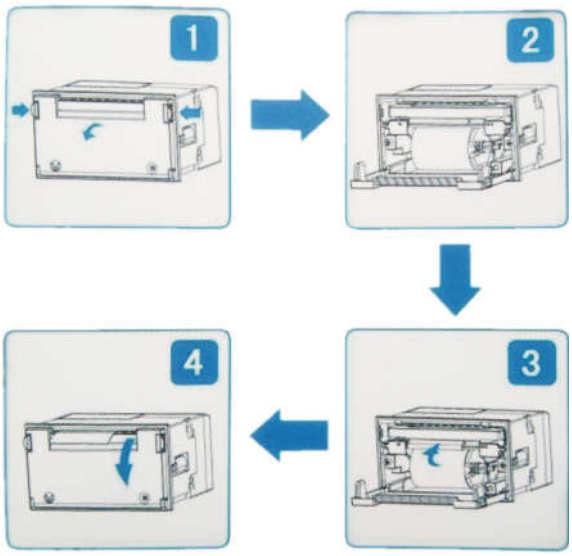
Email：info@leading-instruments.com

Website: www.leading-instruments.com

Appendix

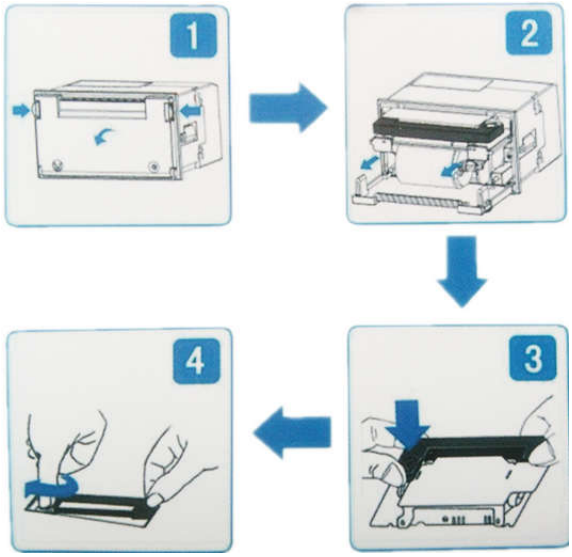
Instruction for Micro-Printer

Replacing the paper roll



1. As figure 1 shows, champ the movable handles both side with fingers, and open the panel.
2. Put the new paper on the paper roller and install the roller firmly on the printer.
3. Power the printer on, and put out a small amount of paper into the feeder. Then press LF button, make the print head to run, and the paper will come out. Turn off the printer.
4. Close the printer cover.

Ribbon



1. Open the paper cover, and draw out the printer following the arrow as show in figure 2.
2. Take down the old ribbon cassette.
   Note: Lift up the left end of the ribbon cassette, then lift up the right end, and then take down the ribbon cassette.
3. Installing new one: Put down gently the right end of ribbon cassette on the gear wheel in the print head. Lift up the left a little, don't put down. If the right edge is not down to the bottom, rotate the knob of the ribbon cassette slightly in clockwise direction as shown in the figure 3, until the ribbon cassette is down to the bottom, then put down the left.

Push the printer back into the original position and close the printer cover.