

## PREFACE

Your choice of the products made by Jinan Langrui Detection Technology Co., Ltd.(Langry) is greatly appreciated. We are committed to deliver you excellent products and satisfied sales services. Please carefully read the instructions prior to use.

1. The instructions are prepared to provide the correct and complete descriptions of related products and data.

However, we do not guarantee that there are no errors or omissions. Therefore, we will not bear responsibilities for any resulting consequences.

2. Langry keeps the right of updating the instructions without prior notice.

3. Langry bears no responsibilities for possible losses from data deviation or incorrect testing conclusion arising from instrument failure and other errors.

4. When the instrument is put into operation, it means that you have carefully read and had full picture of all terms in the instructions, and you have fully agreed to all the terms in the instructions.

5. Langry will not bear responsibilities for all the signed agreements violating the statement during the sales and services process not involving Langry.

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## 1 Overview

The Pull-out Adhesion Tester (hereinafter referred to as the tester) is a testing instrument carefully developed and produced by LANGRY. It is suitable for testing the pull-off force of plutonium nail of fixed thermal insulation material in construction engineering, the bonding strength of wall thermal insulation material and the bonding strength of exterior wall tapestry brick, various plates, paint, etc. The tester adopts mechatronics design, and the whole set of instrument is a whole, including the handle, sensor, digital pressure gauge, stainless steel screw, reaction support and other mechanical parts, forming a structure similar to a door frame. At the same time, the measurement and display circuit are embedded in the instrument, which can directly observe and save data. It has the characteristics of light weight, labor-saving handle operation, and convenient use, etc.

### 1.1 Applicable standards

JGJ144-2019 Technical specification for exterior thermal insulation on external walls

JG158-2013 External Thermal Insulating Rendering Systems Made of Mortar with Mineral Binder

JG149-2015 External thermal insulation composite systems based on expanded polystyrene

JGJ110-2017 Testing Standard of Adhesive Strength of Tapestry Brick for Construction Engineering

JGJ126-2015 Specification for Construction and Acceptance of Tapestry Brick Work for Exterior Wall

### 1.2 Main performance and characteristics

- ◇ Integrated design and embedded measurement LCD circuit
- ◇ Peak holding
- ◇ Manual/automatic storage and deletion of measurement data (500 records)
- ◇ Pressure measurement and display (The area can be set by

yourself)

- ◇ Voltage undervoltage display
- ◇ Measure 10 segment date correction

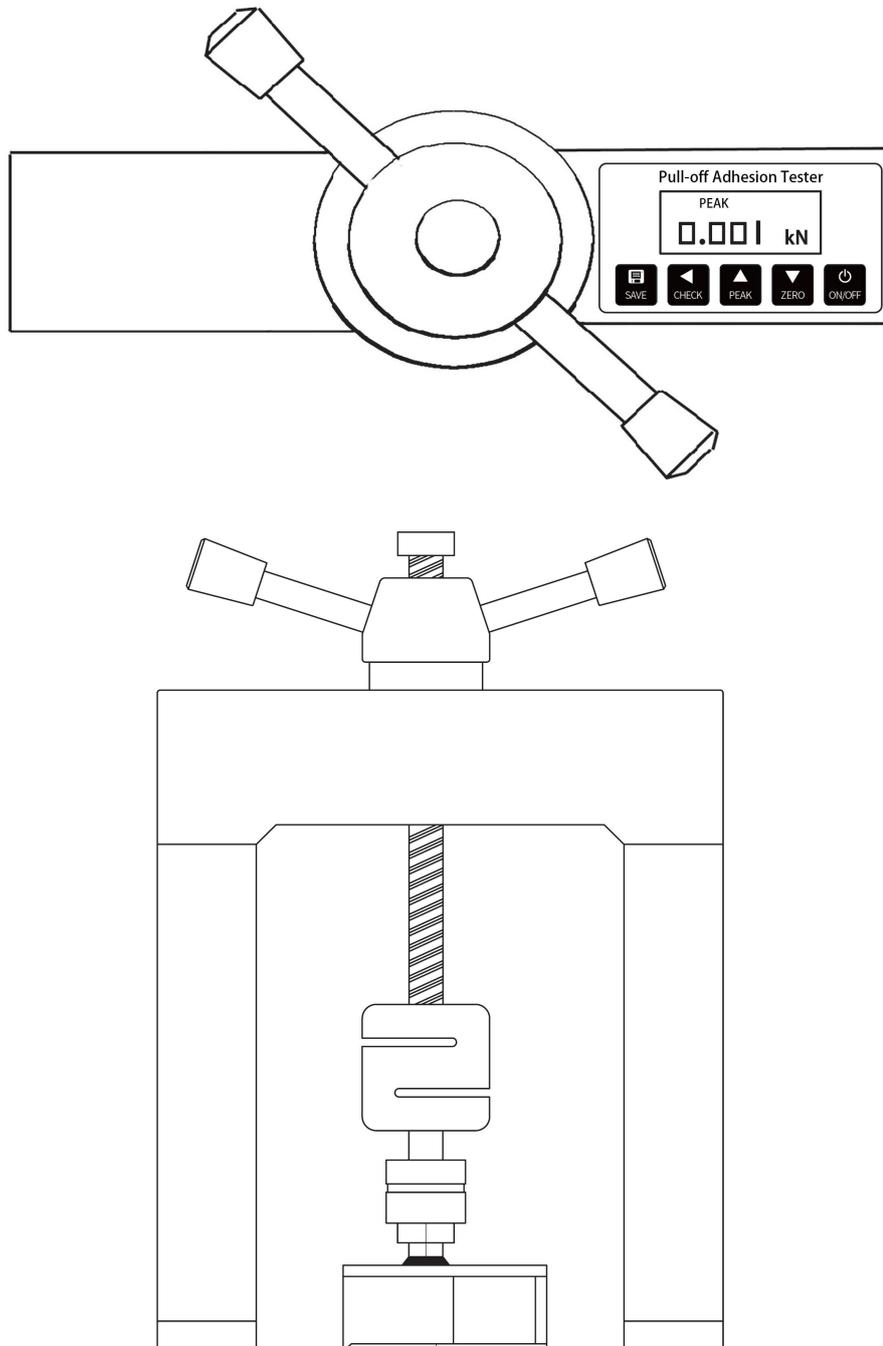
### 1.3 Specification

- ◇ Rated tension value: 10kN
- ◇ Working stroke: 65mm
- ◇ Weight: 3kg
- ◇ Accuracy grade:  $\pm 0.5\%$  (F.S)
- ◇ Resolution: 0.001KN
- ◇ LCD: 2.1-inch blue Segment LCD
- ◇ Power supply: 4.2V rechargeable lithium battery

## 2. Pull-out Adhesion tester

### 2.1 Composition of pull-out adhesion tester

The whole set of tester is a whole, adopting mechatronics design, embedded measurement and display circuit.



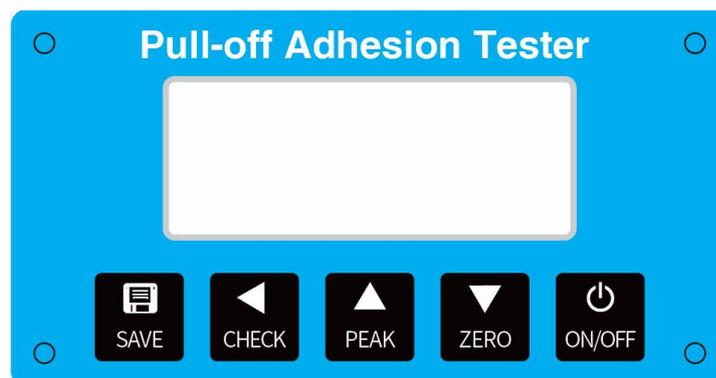
In addition to a set of special pull-out tools for rivets, the tester is also equipped with a set of standard bonding test blocks with specifications of 40mmx40mm and 100mmx100mm.

## 2.2 Working principle

As shown in the figure above, turn the handle clockwise and the lead screw will lift up to drive the S-type high-precision force sensor to move synchronously and apply tension to the standard block. With the rotation of the handle, the pulling force on the standard block gradually increases. When the standard block is peeled off, the force value will quickly decrease back to zero. The peak tension is displayed on the digital pressure gauge. Press the  key to record the maximum tension value.

## 2.3 Digital pressure gauge inspection

Press the switch button at the bottom right of the panel, and the meter will automatically jump to the force measurement interface after 2 seconds of self-checking. Low battery voltage will affect the use of the instrument. Please charge the battery in time when the LCD displays the word "LoBt". Due to the limited battery capacity, the power should be turned off in time after measurement to extend the battery life.



## 2.4 Key description

Content	Function description
	<p>Under calibration: press on the key to set the measurement as the calibration point value.</p> <p>Under setting: press on the key to save change made to parameter.</p> <p>Under measurement: press to save the pressure value.</p> <p>Under check: press to hold for 2 sec. to delete all records on pressure values.</p> <p>Under password: press to go to the calibration process if password is correct. Otherwise, it is not working.</p>
	<p>Under measurement: press on the key to start check.</p> <p>Under check: press on the key to return to measurement.</p> <p>Under password and setting: move the modified bit under change.</p>
	<p>Under measurement: enable or disable the peak status (long press).</p> <p>Under measurement: Switch measurement unit (short press).</p> <p>Under check: go to view the previous record.</p> <p>For parameter change under password and setting: increase the parameter changed.</p>
	<p>Under measurement: press and hold for 2 sec. to clear measurements, and set the current measurement as zero</p> <p>Under check: go to view the next record.</p> <p>For parameter change under password and setting: decrease the parameter changed.</p>
	<p>Under any circumstance: press on the key to switch on/off the instrument.</p>

## 2.5 Operation status

The instrument provides 5 display statuses, which are appropriately marked in the top left corner of LCD, i.e., measurement, check, password, parameter, and calibration.

### 3. Operation description

#### 3.1 Operation description

◇ Press  to switch from the measurement to check, or vice versa.

◇ Under measurement, in case that the measured value is beyond “99999”, “-oL” will show.

◇ Under measurement, press on  to clear the measurements, and set the current measurement as zero.

◇ It is possible to view all records by means of press on   under check.

◇ Press and hold  for 2 sec. under check to delete all recorded data and return to the measurement.

◇ The battery of this machine is 4.2V lithium battery. Please use the supplied adapter and connect the charging plug to the charging hole on the side of the instrument when charging.

Note: Deleted data cannot be restored, please operate with caution

#### 3.2 Area parameter setting

The area parameter modification is controlled by a password. Area parameter modification status can only be accessed to with a correct password. Carry out shutdown to exit the system in response to entrance by mistake! Modification steps: press and hold the  key to turn on the password to enter the password state, enter the password “1234”, then press the  key to enter the area setting interface, select the corresponding area code in the table below, and then press the  key to save and return to the measurement state.

Code	Unit/Area
No	KN (Factory Default)
F0	MPa/KN Conversion, 100x100mm
F1	MPa/KN Conversion, 45x95 mm
F2	MPa/KN Conversion, 40x40mm
F3	MPa/KN Conversion, $\Phi$ 50mm
F4	MPa/KN Conversion, custom area (cm <sup>2</sup> )

### 3.3 Instrument calibration

Calibration setting is protected by password. Pressure calibration status can only be accessed to with a correct password. Carry out shutdown to exit the system in response to entrance by mistake!

Step: ① Access the password status by pressing to hold the  key, and then enter password 1111. Press  to enter into the calibration status. ②The instrument provides “0%” indication at the top row. Now, ensure that the instrument is not pressurized, and the standard dynamometer reading is zero. The instrument provides “100%” reading at the top row in response to press on . Now, start pressurization with hand pump until the standard dynamometer reading arrives at the full-scale pressure of the instrument. Press the  key to complete calibration at 100% scale point. After calibration, the instrument automatically exits the calibration status. The calibration accuracy can be maintained despite power-off. Repeat the steps above if the accuracy re-measurement is still unsatisfied, or carry out the segment data correction (Section 3.4). Since the instrument adopts high-precision sensors and high-precision AD chips, the measurement data has a good linearity. Generally, it can

meet the requirements of conventional detection without date correction. Therefore, the functional description of the date correction can be ignored.

◇ Do not care about the value displayed at the bottom of the LCD when calibrating.

### 3.4 Date correction

Principle of data correction: when the sensor input signal arrives at the instrument, make comparison with the standard conversion value at each data point in the line chart in the order of conversion values, and then obtain corresponding measured value at the line chart in the appropriate zone. Following the calibration of measured value, automatically start the data correction.

Similarly, the broken line correction is also controlled by the password. Press and hold the  key to start up and enter the password state. Under password status, enter 3333, and press on storage key to go to the data correction status. A data point requiring correction in any zone is available by   key. Start pressurization with hand crank. When the pressure value corresponds to a data point, press on  key to save the current data point. The tester is configured for a full-scale of 10KN. In response to data correction in a range of 1-2KN, the instrument shows 0% after accessing the data correction status. Press on the  key to vary to 10%. Start pressurization to 1KN in the standard dynamometer. Press on the  key, and the instrument shows 20%. Then, start pressurization to 2KN in the standard dynamometer, and press on the  key. Now, reboot the instrument to end correction.

### 3.5 Restore factory settings

If the pressure display value is disordered, the measured value has a large deviation, the pressure gauge is set incorrectly or the calibration operation is incorrect, you can enter the password state, and enter 9898 to restore the factory settings.

## **4. Precautions**

1. Overload is strictly prohibited and can only be used up to 10kN. Otherwise, permanent damage may occur.
2. Keep the system clean. After use, turn the crank counterclockwise to return the lead screw to its original position.
3. Put the tester on a solid ground so that it can sustain pressure vertically.
4. Charge regularly and store in a dry and cool place.

## **5. Package, transport, and storage**

The tester is packaged in a plastic sealed box. together with operation manual, certificate of conformity, packing list, attachments, etc. Please carefully check to avoid omission. The tester in container may be shipped in the common mode of transport. Provisions shall be made to prevent overspill and exposure to bad weather during shipment. Store the tester in a well-ventilated place free of exposure to bad weather.

## **6. Accessories and Warranty**

The tester is typically delivered complete with:

1. One tester host
2. Two sets of hook type pull-off test blocks
3. One set of special pull screwdrivers for rivets
4. One set of charging adapter and data cable
5. One certificate of conformity and one operation manual

The product is guaranteed for one year under the specified conditions of use and maintenance for life. If there is a problem with the product, please contact our client service in time.

## **Manufacturer warranty**

Langry guarantees that the tool is free from defects in materials and manufacturing processes when it leaves the factory, and the warranty is valid only if the user correctly installs, operates, maintains and cleans the tool in accordance with Langry's operating instructions.

The warranty covers the free replacement or repair of damaged parts during the whole service life of this tool. If the parts need to be repaired or protected due to normal wear and tear, they are not covered by the warranty.

Other claims are not covered by the warranty unless there is a different provision under the specific law of the customer's country. In particular, langry shall not be liable for any direct, indirect, incidental or inevitable damage, financial loss or additional expenses caused by or related to the improper use or abuse of this tool. Expressly exclude implied warranties of merchantability and fitness for a particular purpose.

In case of repair or replacement, the tool or relevant parts shall be sent to Langry's market organization immediately after the failure is determined.