

KD-3D Type Intelligent Tablet Hardometer

Direction of Usage

Manufactured No.:

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Introduction of Product

KD-3D Type Intelligent Tablet Hardometer is a professional instrument for test of hardness and quality of tablets with excellent quality. The instrument is applicable to test of tablets and is one requisite instrument used in laboratories of pharmacy factories, medical teaching and research, medicine inspection departments

High-speed Chip Microcomputer Control System is used in the instrument with superpower data processing capacity. It can measure Max, Min, Average, standard deviation, discrete coefficient report.

The instrument has a blue large-screen LCD graphic monitor with friendly interface. Function is operated by menu, operation is easy and dialogue between computer and operator can be realized actually. The instrument is characterized by distinct content, high precision, high repeating performance of test, visual and distinct reader, configurable unit of measurement kg and N by operation of software.

The instrument provides powerful reference to relevant test data such as hardness of tablet, packing method of medicine, reliability of transportation method, collapsing degree of tablet, dissolution of tablet.

I . Main Parameters

Scope of pressure for testing tablet	0~30 kg
Max diameter of tested tablet	30mm
Precision of Pressure and Hardness	±0.5% of FS.
Resolution	0.01 kg
Input Power	30W
Noise	<50dB
Power Supply	220V ± 10% 50Hz

II . Working Principle

YPD—300D Tablet Hardometer applies pressure to tablet by mechanic transmission, thus changes occur in bridge circuit of load transducer with CMC sign of scale license. The variation is amplified by super high calculator, then passes through A/D conversion circuit, chip machine processing circuit. Then reader circuit displays reader of hardness of pressured tablet in unit kg and N visually in LCD by Chinese. Key for restoring deletion of data out of error is available. It can do auto-checking when failure occurs and give prompt message in Chinese.

III. Operation Method

After power supply is ON, start interface is displayed in LCD. Buzzer sounds once. Then system will initiate AD converter, then is ready for operation without failure. In such ready state, the first line in LCD displays string of “=KD-3D=” and the 3rd and 4th lines display current date and time respectively in ready state. If date and time are not correct, please preset them by menu. Concrete operation will be discussed later.

Operations in Ready State:

In ready state, users can operate only keys of Programming and Confirmation, described as followings:

1. **Press down key of Programming in ready state:** If parameters are to be preset, press down the key in ready state. User can preset parameters in this way, press down the key in ready state, user can select parameters to be preset. Please refer to follow content for concrete operation and meaning of parameters.
2. **Press down key of Confirmation in ready state:** Press down the key in ready state to execute following functions.
 1. Test of hardness
 2. Test of transducer and certification of scale.
 3. Operation test of motor.Please Concrete operation Please refer to follow content for concrete operation.

Configuration of Parameters:

To preset parameters, press down the key of **Programme** in ready state so that following content can be displayed in LCD.

1. Preset parameters.
2. Parameters of output report.
3. Parameters of function.

For easy operation of user, there should not be too many parameters in one place. We classify parameters into four categories. The first, second and third kind are for users.

When configuration is started, the first kind of parameters, namely "Configuration of parameter" will flash, indicating that the first kind of parameter is current choice. Corresponding digital key can also be pressed directly for selecting other parameters. For instance, if user press down the key of "3", then function parameters are selected. Keys of Up and Down can also be used to loop cursor in various parameters. When certain parameters are selected, press down the key of Confirmation to determine parameter kind selected. Please press down the key of Exit to exit in ready state.

When certain parameter kind is selected, keys of Up and Down can also be used to loop cursor in each item preset in such kind of parameters. In this time, reader of LCD is just current value of the parameter. It is not in real configuration state. When parameter is to be preset, please select it and then press down key of Confirmation, the corresponding position in LCD will flash, input data now. Some parameters are for special operation only such as saving data from instrument to U-disk, reset default of ex-factory parameters. These parameters need no input of parameters. When digit is needed for presetting, some keys in panel will become secondary functions as followings:

1. Key of Up: Delete input.
2. Key of Down : Input underline.
3. Key of Programming: Function for rectifying malfunction is provided.
4. Key of Exit: Function of printing currently tested data is provided.

5. Key of “*”: Input decimal point and print statistic data.

Configuration Parameter

The kind of parameters is for some regulatory configuration, including:

1. Systematic clock: Used to preset time and date of instrument. Press down key of Confirmation to preset, year of date can be modified firstly (value of year is flashing.). User can input year, then press down key of Confirmation to save. If you don't want to modify year, you can just press down key of Confirmation without input of digit, then the next target is set focus (loop among year, month, day, hour, minute, second). After configuration, press down key of Escape to exit.
2. Modify Password: Modify password of user.
3. Retained number after decimal point.
4. Unit of Result: Kg, kgf, N are optional.
5. Auto zeroing in measuring: In measuring hardness, clearance will be done after measuring each tablet.

Functional parameters: Parameters for some operations.

1. **Calibration of force transducer:** It is an important operation and should be operated cautiously. It has direct influence on whether instrument can work correctly and precision of measurement of instrument. Manufactures must execute this step before ex-factory. This operation is for calibrating zeroing and slope of standard pressure transducer. Even same type of pressure transducer has different parameters, to ensure precision of measurement, pressure transducer must be calibrated. Purpose of calibration is to get relation between voltage of output of pressure transducer and weight. The principle is same as calibration principle of electric scale. When electric scale is calibrated, output of pressure transducer without anything on tray of scale is recorded as zeroing. Then user is required to place a stipulated standard counterweight (to ensure precision of FS, weight of the counterweight is close to upper limit of FS, for electric scale whose counterweight is put inside, it is completed by internal machinery). Through calculation, relation between voltage of output of pressure transducer and weight can be obtained by which object is weighted later. Purpose, principle, process of calibration of our instrument is same as this completely. There is corresponding indication in LCD through the operation. Once in state of presetting parameters, the first and second lines will be flashed with display of “Don't exert any pressure on transducer or place any object”. Press down key of confirmation, the instrument will save current output of pressure transducer as zeroing to internal memory (which will not lose without electrifying). If no error prompting appears, it indicates that zero calibration has been done successfully. Then prompting message of “please place calibration weight and input weight”, at the time, user should place one object with known weight on transducer. The weight is

equivalent to standard counterweight in electric scale. To ensure precision of FS, weight of the counterweight should be close to upper limit of FS as far as possible. The instrument doesn't require weight of object is an integer, precision after calibration can be ensured as long as weight of object can be input precisely (user can get precise weight by other weighting configuration). Furthermore, when object is placed on sensor, user must ensure gravity centre of object is applying force to central part of pressure sensor so that precision of calibration can be guaranteed. It is same as putting weighted object in center of tray as far as possible in calibrating electric scale or weighting object. For easy calibration, user should dismantle sensor from instrument and lay it flatly before calibration. After user have placed the weight for calibration and input weight precisely, press down key of Confirmation to finish calibration. The instrument will save current time to memory. Therefore, the clock must be right before calibration. After calibration, the instrument should return to ready state. Press down key of Confirmation and select Test of Sensor to check precision of measurement after calibration.

In following cases, sensor needs to be calibrated.

1. The machine has been produced and assembled just now.
2. Sensor has been replaced.
3. It is most possibly that precision of measurement cannot meet requirement.

In addition, user should check precision of measurement of sensor regularly (for instance, every 3 months) in state of Test of Sensor, it needs recalibration if precision of measurement cannot meet requirement.

Test of Sensor: The function is for easy checking precision of measurement of instrument and certification of Scale Bureau. It is not a required operation. After user completes calibration of sensor, he should check effect of calibration in the mode. There are two ways of test: High precision mode and high speed mode.

In ready state, press down key of Confirmation, following options will be shown in LCD:

1. Start to measure
2. Test of Sensor

Key of Down can be pressed or Number Key "2" is used directly to select function of second item, Test of Sensor, then press down key of Confirmation, following options will be shown in LCD:

1. High precision mode
2. High speed mode

In high precision mode, speed of AD converter is 10Hz. High precision can be achieved due to low speed of conversion. In high speed mode, speed of AD converter is 80Hz (such mode is adopted in measurement of hardness), it has not only high speed of conversion but also high precision. It is sufficient to meet requirement. There is no perceivable difference in precision of measurement between the two modes. Use

can select any mode.

Once the mode is selected, press down key of Confirmation, following options will be shown in LCD:

Calibration —High Precision Mode	Calibration—High Speed Mode
Output of AD:	Output of AD:
Speed of Conversion:	Speed of Conversion:
Weight: kg	Weight: kg

The kind of parameters can be browsed by user only. Only manufacturer can preset it according to requirement. At the time, user can put a object with known weight in pressure sensor and observe whether reader of LCD is in accordance with its weight so that precision of measurement can be determined for appraisal whether recalibration is needed or not.

In the two modes, user can press down key of “0” for zeroing. It is equivalent to key in electric scale for removal of peel. The instrument will take voltage of output of current pressure sensor as zero, but the value doesn’t be saved. The instrument still takes zero in lately calibration as zero.

Press down key of “Exit” to exit the mode.

Working Method:

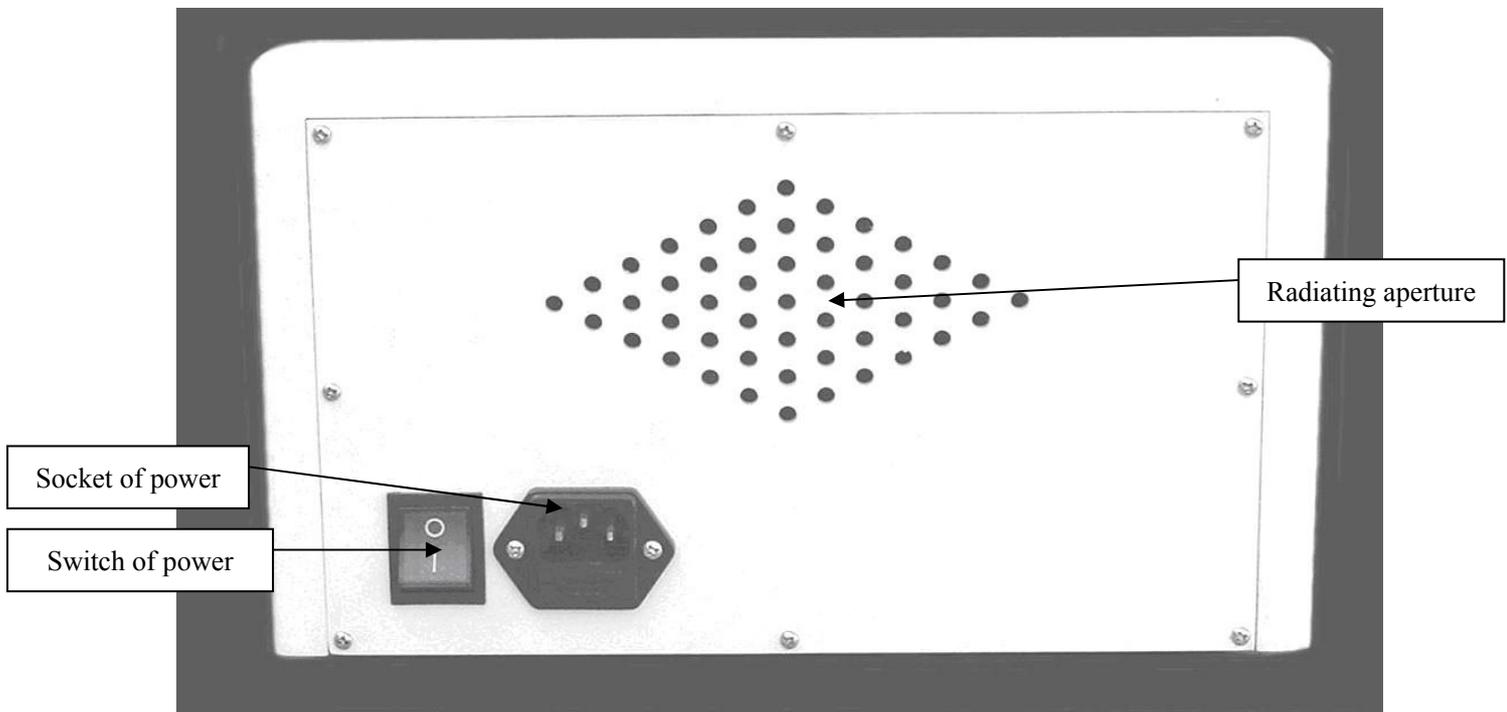
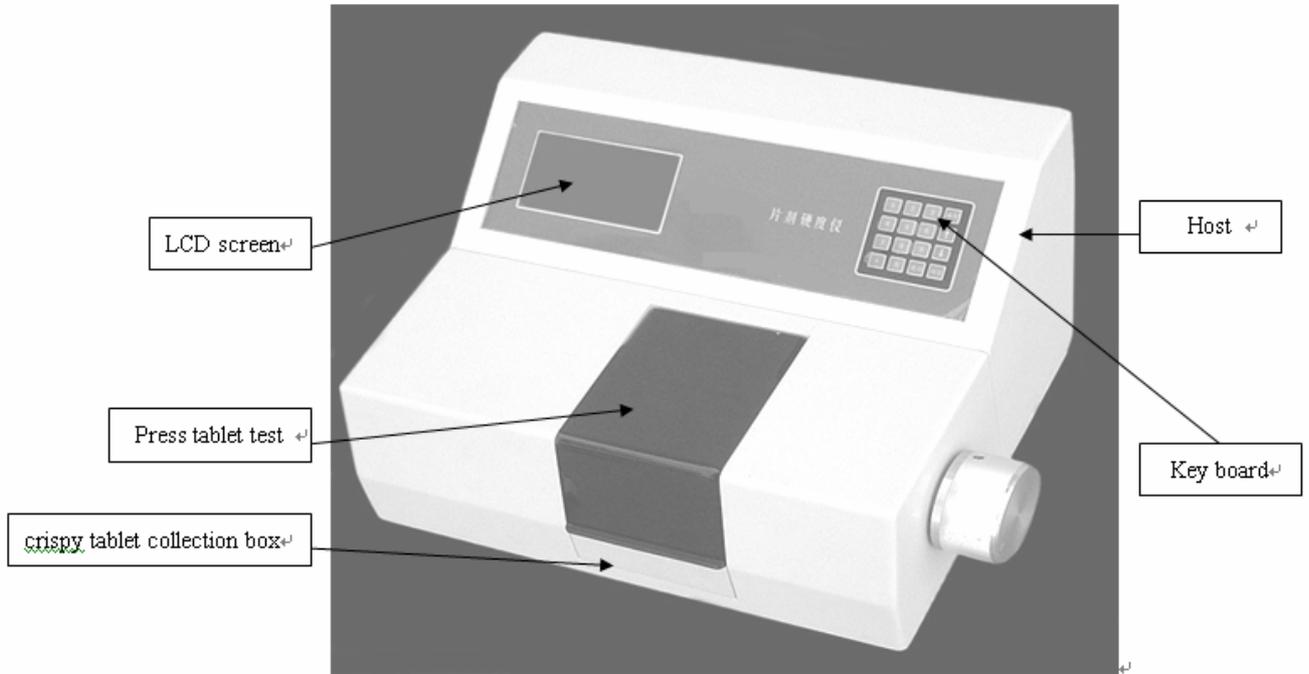
turn on power switch, initialization AD converter, and well place the pills to be measured, rotate the handle clockwise until measured tablet hardness, maximum, minimum and average value. And then rotate the handle counterclockwise to remove residual debris, prepare for the next pill test.....till the end. Press down key of “Exit” to exit the display and statistic all measured data.

IV. Attentions

1. The instrument should be placed in workbench flatly. Check and make sure working environment and voltage of power supply meet requirements to technical specifications.
2. The instrument should be preheated 10 minutes after starting before service.
3. Check and make sure grounding of power supply is reliable and in good condition.
4. When instrument is in operation, any foreigners except tablet should be placed between active and passive pressuring heads.
5. If instrument stops operation due to malfunction, please turn off power supply and start instrument again.
6. The instrument cannot test non-crispy tablet.
7. The instrument should be delivered to relevant local authorities for appraisal annually according to relevant stipulation in the industry.
8. Please refer to illustration and written explanation for concrete operation.
9. If failure occurs, only professionals can open shell of instrument. Please contact with sales department in emergency.

V. Illustration on Structure of Instrument

1. KD-3D Type Intelligent Tablet Hardometer



KD-3D Type Intelligent Tablet Hardometer

Quality Certificate

Date:

Checking note:

Serial No.	Items	Accuracy	
		Technology Requirements	Checking
1	Measure tablet Maximum diameter	30mm	
2	Measure tablet pressure range	0~30kg	
3	Hardness testing accuracy (maximum range)	±0.5%	

Packing list

Serial NO.:

Dimension: × × mm

gross weight: _____ Kg

net weight: _____ Kg

packing list:

Serial No.	Items	Specification	Quantity
1	Manual instruction		1 copy
2	Certificate (packing list)		1 copy

3	Operation instruction		1 copy
4	YPD300D host		1 set
5	220V power wire		1 pic
6	Cleaning brush		1 pic
Packaging checker:			