JD SERIES

ELECTRONIC BALANCE
A II
INSTRUCTION MANUAL

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1. brief introduction

The instruction manual describes the installation instructions, operation methods and care and maintenance etc..

Please read the instruction manual carefully before using it.

1.1 matters needing attention

A. The manual takes JD200-4 for example

B. To make sure that the balance can provide a more accurate result before using the balance, plug in and preheat the balance at least for 30 minutes.

C. Put the balance on a stable and flat platform.

D. Be sure to adjust the balance to the level condition when using it.

E. When weighing the heavy object, you have to handle it gently to avoid the strike on the pan. Otherwise it will lead to the problem of the mechanical system homing of the balance.

F. When weighing the liquid, you have to do it carefully to avoid the liquid flowing into the inside of the balance.

G. After the operation, please close the door of the weighing room and cover it with the dust cover to avoid the dust.

1.2 balance's features

A. Multiple weighing units and the made units for the customers

B. counting weighing

The different counting cardinal number can be selected for the counting calibration. It supports the percentage weighing.

C. Standard RS232 interface, it is easier for the user to connect the balance to a printer or computer or other external device.

D. Support the PRINT key to control the data output and command to control the data output for the convenience of the data collection of the external device.

E. The digital display of cobalt blue fluorescent character-display tube is legible and striking.

1.3 technical parameters

table 1

model	JD500-2	JD1000-2	JD2000-2	JD3000-2	JD4000-2	JD5000-2
capacity	500g	1000g	2000g	3000g	4000g	5000g
calibration weight	500g	1000g	2000g	2000g	4000g	5000g
sensor	electromagnetic force sensor					
readability	0.01g					
repeatability error	±0.01g					
four-corner error	±0.02g					
linearity error	±0.02g					
stability time	约 3s					
pan size	Φ160mm					
weighing room size	no					
dimension	335×205×100mm					
calibration mode	external auto-calibration (no standard weight)					
net weight	5kg					
interface	RS232					
power source	DC15V 1A power consumption≤20W					

table 2

model	JD100-3	JD200-3	JD300-3	JD400-3	JD500-3	JD1000-3
capacity	100g	200g	300g	400g	500g	1000g
calibration weight	100g	200g	200g	400g	500g	1000g
sensor	electromagnetic force sensor					
readability	0.001g					
repeatability error	±0.001g					
four-corner error	±0.002g					
linearity error	±0.002g					
stability time	约 3s					
pan size	Φ90mm					Φ160mm
weighing room size	175x175x185mm					
dimension	335x205x295 mm					
calibration mode	auto-calibration (external weight) JD1000-3 (no standard weight)					
net weight	6.7kg					
interface	RS232					
power source	DC15V 1A power consumption≤20W					

3 table 3

model	JD100-4	JD110-4	JD200-4	JD210-4
capacity	100g	110g	200g	210g
calibration weight	100g	100g	200g	200g
sensor	electromagnetic force sensor			
readability	0.0001g			
repeatability error	≤±0.0002g			
four-corner error	≤±0.0003g			
linearity error	≤±0.0003g			
stability time	<5s			
pan size	Φ90mm			
weighing room size	175x175x185mm			
dimension	335x205x295 mm			
calibration mode	auto-calibration (external weight)			
net weight	6.7kg			
interface	RS232			
power source	DC15V 1A power consumption≤20W			

testing conditions: 20℃(room temperature),the environment without air flow, dry and dust.

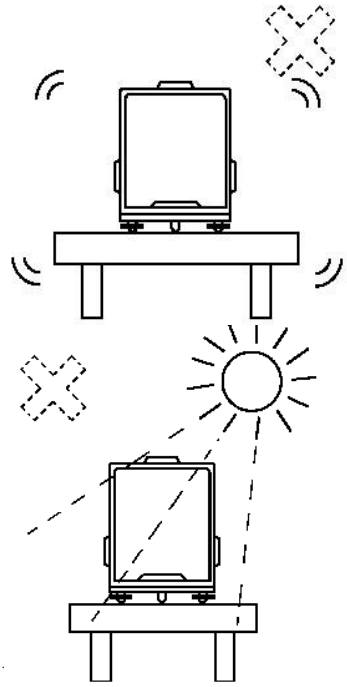
2. Installation

2.1 installation detailed list

serial No.	content	quantity
1	balance body	1 piece
2	pan	1 个 piece
3	pan support	1 个 piece
4	draft ring (portion of models)	1 个 piece
5	dust guard (portion of models)	1 个 piece
6	power adapter	1 个 piece

2.2 installation environment

The balance can get the reliable weighing result in the common environment of the laboratory and workshop. It can improve
the work efficiency and boost the accuracy of the weighing result in the proper environment.



A. Put the balance on a stable and flat platform.

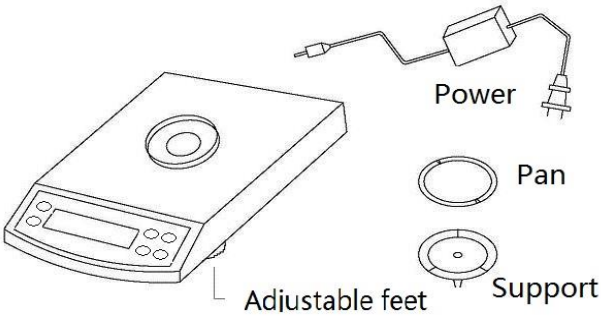
B. Do not put the balance:
*In a place with too much dust;
*In direct sunshine;
*In a place with temperature extreme;
*In a place with excessive air flow;
*Near electromagnetic field;
*In a place with excessive moisture;
*In a place with temperature difference

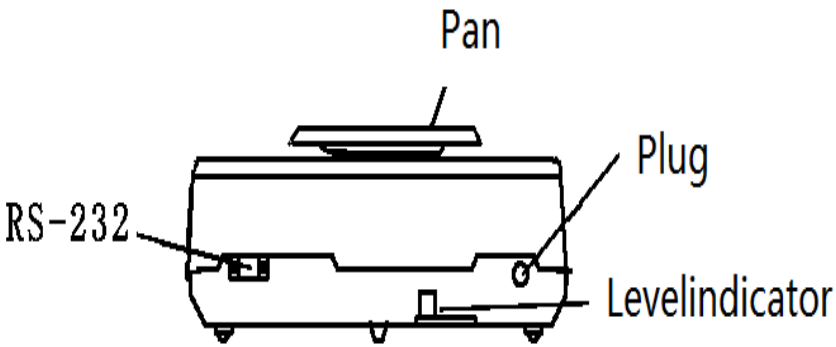
fluctuation.

C. The best settlement site should be in a sheltered corner, on the stable marble platform and far away from door, window, radiator and the air outlet of the air conditioning equipment.

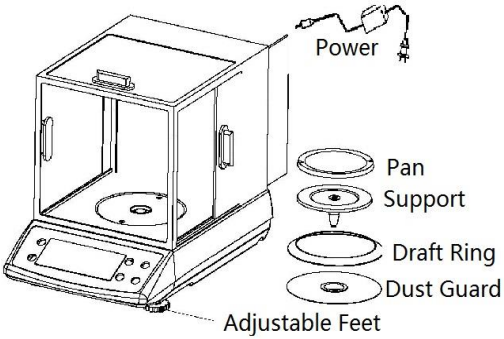
2.3 external schematic diagram and parts names

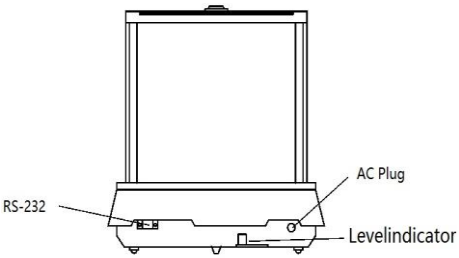
JD-2 series





JD-3/JD-4 series





2.4 pan components installation

Install the pan components in order of the pan, pan support, draft ring and dust guard and then install the components on the pan erection column.

2.5 level adjustment

The balance is equipped with the bulb of level and 2 pieces of level adjusting feet for offsetting the affection of the weighing result due to the tiny uneven platform. Adjust bubble of the bulb of level to the center to keep the balance in the level condition. You have to adjust it when you move it each time.

2.6 connecting power source

Be sure that the input voltage range of the power adapter is suited to the used service voltage.

First connect the power plug of the adapter with the jack socket on the backside of the balance. And then connect the power adapter with the power socket.

3. application

3.1 basic weighing

A. preparation procedure
a. The balance should be reheated for 30 minutes at least after each time of the power-on for the best weighing result.
b. Keep the pan clean. Press ON/OFF key and it will display 0.0000g.
c. Calibrate the balance (refer to the calibration section)
d. If need to use other unit, or other weighing method, press [MODE] key to adjust the display data to other units or the data of other weighing method. The triangle symbol below the display screen indicates the other units or other weighing method.
B. weighing procedure
a. Open the door of the weighing room and put the object on the center of the pan lightly. After then close the door lightly. The triangle symbol above " stabilization" on the display overlay represents the stable symbol. When it's kept unchanged after the stable symbol displayed, it means that the data stabilized and after then it will read the data.
b. Open the door and take out the object. After the balance returns to the zero and it displays 0.0000g and stabilizes, you can proceed with the next weighing. If not, please close the door of the weighing room avoiding the dust immersing into the inside of the balance.

3.2 container weighing

A. Put the container on the pan
B. After the stable indicator displayed, press TARE key. After then it will display 0.0000g.
C. Put the object in the container
D. After the stable indicator displays, read the weight of object.

3.3 counting weighing。

A. Select the samples quantity according to the system parameters table.

B. Press TARE key. After the balance stabilizes it will display 0.0000g.
C. Press MODE key to adjust the balance to the counting mode status.
D. Put the object on the center of the pan and close the door of the weighing room.
E. Press CAL key and the balance system will sample according to C1 parameter.
F. After the sampling, the balance will display the sample weight according to C1 parameter. Take out the sample. After the balance returns to zero and stabilizes the user can proceed with the operation of the counting weighing.

Note. The readability of the sample quantity shouldn't be less than the minimum resolution.

3.4 percentage weighing

A. Press TARE key. After the balance stabilizes it will display 0.0000g.
B. Press MODE key to adjust the balance to the percentage weighing status.
C. Put the object on the center of the pan and close the door of the weighing room.
D. Press CAL key， the balance system will take the sample as the reference object which is 100.00% basic value.
E. After the sampling, the balance will display 100.00%. Take out the sample. After the balance returns to zero and stabilizes the user can proceed with the operation of the percentage weighing.

Note: The readability of the sample quantity shouldn't be less than the minimum resolution.

4. parameters setting and command control

4.1 parameters setting

A. Press ON/OFF key, the balance will be in stand-by status.
B. It will display standby symbol (the triangle below the screen will display recurrently).
C. Press PRINT key twice continuously and it will display “Cx-y”.
D. Press MODE key to change C parameters.
E. Press PRINT key to change y value of the function No.
F. After all the parameters were set, press TARE key and it will be in stand-by status and store the current set parameters. Press ON/OFF key again the balance will be in a certain condition of the function of the new setup parameter.

Cx	Cx—y	significance
C1:auto calibration	*C1—0	This model has no such function
	C1—1	
C2：counting weighing mode/data selection of basic sample	*C2—0	quantity: 10 as basic sample quantity
	C2—1	quantity: 20 as basic sample quantity
	C2—2	quantity: 50 as basic sample quantity
	C2—3	quantity: 100 as basic sample quantity
	C2—4	quantity: 1000 as basic sample quantity
C3：zero tracking	C3—0	no zero tracking status
	*C3—1	zero tracking
	C3—2	no use for the user
C4：selection of serial port baud rate	*C4—0	2400bps
	C4—1	1200bps
	C4—2	4800bps
	C4—3	9600bps
C5：selection of	C5—0	stable output of back-to-zero
	C5—1	stable output

data output mode	*C5—2	command control output
	C5—3	continuous output
C6：key sound	*C6—0	no
	C6—1	yes
C7：anti-interference extent	C7—0	sensitiveness
	*C7—1	low
	C7—2	medium
	C7—3	high
C8：subtitle display power on	*C8—0	yes
	C8—1	no
C9：auto calibration frequency	C9—0	support some of the analytical balances only
	*C9—1	
	C9—2	
#C10：check-weighing measuring	*C10—0	Alarm within the set interval check-weighing including the limiting value
	C10—1	Alarm without the set interval check-weighing including the limiting value
#C11：selection of weighing status	*C11—0	standard weighing
	#C11—1	density weighing
	#C11—2	statistics weighing
#C12:sampled data of animal weighing	*C12—0	100
	C12—1	200
	C12—2	300

#: reserving function according to the user request
*: default status set at the factory

4.2 command control

The balance can be connected with the peripherals via serial port communication line to receive the command from the peripherals and execute the similar key operation according to the command.

After the balance receives the command, it will post back the received command to the external device at once and inform the external device of the successful response command. If the wrong

command posts back the “Err”to the external device, it means what the external device received is the illegal command.

Effective command as follows

A. O ＜CR＞＜LF＞ ON/OFF command.
The function is the same as the function of **ON/OFF** key on the overlay（4F 0D 0A)；

B. T ＜CR＞＜LF＞ TARE command.
The function is the same as the function of **TARE** key on the overlay（54 0D 0A)；

C． C ＜CR＞＜LF＞CAL command。
The function is the same as the function of **CAL** key on the overlay（43 0D 0A)；

D． M ＜CR＞＜LF＞MODE command
The function is the same as the function of **MODE** key on the overlay （4D 0D 0A)；

E． P ＜CR＞＜LF＞PRINT command
The function is the same as the function of **PRINT** key on the overlay. If only the balance receives this command, it will output a group of current important data to the external device （50 0D 0A).

＜CR＞＜LF＞the significance as follows

＜CR＞：carriage return（0D）

＜LF＞：line break（0A）

5. calibration operation

5.1 calibration reason

The balance is designed and manufactured based on the "electromagnetic force equilibrium principle" .Among of the numerous factors which has an effect on the precision, the earth gravity effect is the most prominent. The different areas and different earth gravity will cause the measuring error. In this case the balance should be calibrated to eliminate these errors.
After the use for long time, there will be subtle error caused by the temperature, humidity, placing and operation. So the balance must be recalibrated and adjust its level.
If you use the new balance or after changing the locating place of the balance, you have to adjust the level and recalibrate it.

5.2 calibration procedure

Calibration operation as follows: (JD200-4 as the example)

A. Empty the pan and then it will display 0.0000g.
B. Press CAL key.
C. When it displays "CAL- - 0" press TARE key.
D. When "CAL- - 0" flashes the system will be waiting for the data sampling and then it will display "C 200".
E. Open the door of the weighing room and load lightly the 200g standard weight on the center of the pan. After then close the door.
F. Press TARE key. When "C 200" flashes the system will be waiting for the data sampling and then it will display"CAL－End"
G. After about 2 seconds it will display "200.0000".
H. Take away the weight.
I. It will display "0.0000".

Note: During the calibration, if it displays"Err-1", it means that the balance can't be calibrated because of the calibration weight with big error. Please select the proper weight to do it. After then, if it still displays "Err-1", please contact our company for the solution.

6. RS232 interface

During the user operates the balance, sometimes the user will print out the weighing data via printer or input it into the computer or other external devices.

In order to meet the user's requirement, we installed RS232C or USB-B data communication interface on JD series electronic balances with the multi-function and high precision.

Among them, RS232C is the standard equipped interface. USB-B can be installed as the user requests.

6.1 technical parameters

baud rate: 1200，2400，4800，9600

data bits: 8

check bit: no

stop bit: 1

start bit: 1

output code: ASCII code

Data output format: FXXXX.XXXXKKK＜CR＞ ＜LF＞

Significance as below

"F"：sign bit "+"or"-"

"X"：0-9 weight data

"."： decimal point

"K"：reserved three-digit weighing units symbol with right alignment.
If it's short of three-digit weighing units, we can supplement it with blank.

<CR>：carriage return

<LF>：line break

The data format which the value of the quantity data (+10.0000g) goes through the serial port is +0010.0000g<CR><LF>.

The judgment method of stable data output and unstable data output: When the data output of the unstable weight "KKK", the non-unit bit indicating bit in the data string, is the blank. When the stable data out puts it will out put the unit information.

The other data output format can be programmed as the user's requests.

6 .2 output mode

A. the stable output mode of back-to-zero

In the stable output mode of zero, the pan must be unloaded when weighing the sample each time. After it displays the stable zero value, put the sample on the pan. When the displayed value becomes stable, it will out put a group of data. The parameter is set as C5-0.

B. the stable output mode

In the stable output mode, the data output doesn't depend on any other condition. When the weighing value becomes stable (It will display the stable symbol.) it will out put a group of data. In this mode, it can out put its own weight of the sample which has been tared. And also it can out put the total weight value together with the tare weight or the cumulative weight of the sample. The parameter is set as C5-1.

C. The continuous output

In the continuous output mode, the balance transmits the weight data to the external device every 0.3s. The parameter is set as C5-3.

D. printing key output mode/command control output

In the printing key out mode, only when pressing PRINT key or the balance receives the printing command from the external device it can out put a group of current weighing data. The parameter is set as C5-2.

6.3 connecting with external device

electronic balance 9 pins	computer 9 holes	electronic balance 9 pins	printer with serial port 25 pins
2	2	2	2
3	3	3	3
5	5	5	7

The connection diagram of the electronic balance with the computer and printer

7. care and maintenance

A. The user should often calibrate the balance to be sure that its sensitivity is in the best condition.

B. Don’t touch the key using the pointed stuff or the shaggy stuff like the stick (something like the pencil, ball-point pen).

C. Avoid the object falling down on the pan from the highs so as not to damage the weighing mechanism.

D. Avoid the balance exposing to the high temperature or dust for a long time.

E. Keep the balance chamber clean. If some stuff fell inside, you have to clear it away on time.

F. After each use of the balance, it’s better to cover it to avoid the dust incursion.

G. For long time if you don’t use the balance, it’s better to store it for the moment.

H. If the balance broke down, you have to examine and repair it on time. It’s not allowed to use it with the faults.

I. Avoid using overloaded operations so as not to damage the balance.

J. Keep the balance clean and dry.

matters needing attention when cleaning

A. Pull out the power line before cleaning;

B. Don’t use corrosive cleanser (like solvent). You can use a piece of wet cloth with the neutral detergent (soap) to clean it.

C. Avoid the water or other liquid splashing into the inside of the balance.

D. Wipe dry the balance with dried, soft cloth after cleaning.

8. failures and solution

fault	cause	solution
no display	●no power supply ●fuse broken ●damaged AC/DC adaptor	●plug in power cord ●change fuse ●replace adaptor ●Broken again after changing, be repaired in the maintenance dept.
unstable display value	●bad work environment ●weighing room door not close properly ●touching of pan with machine shell or foreign matter between them ●unstable power supply, beyond allowable value ●unstable weighed object（as it absorbed moisture or moisture evaporated）	●improve the work environment, keep away from vibration and airflow disturbance ●Take out the foreign matter. Turn the pan avoiding the touch. ●Connect an external AC power regulator
Discrepancy between displayed value and actual weight	●Not calibrate ●No zero clearing before weighing ●Not adjust level	●Calibrate the balance ●Press TARE key for zero clearing ●Adjust the level

9. guarantee repair

Warranty period; 1 year
Except of one of the items below
1. Warranty period expired.
2. The balancer was damaged because of the user's fault.
3. The balance was damaged because the user operated it not according to the instruction manual.
4. The balance was damaged by reason of exposing to the environment with the radioactive and corrosive materials.
5. The balance was damaged caused by the unauthorized disassembly or repair by other maintenance personals not appointed by our company.

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