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8304
ELECTRONIC BALANCES
OPERATION MANUAL

V0

1 Notes

1.Please preheat the balance for 30 minutes in order to ensure the weighing is more accurate.

2.The normal work of the balance should be well-adapted to the environment, it should be put on the stable horizontal table. Don't put the balance in the unstable desk; do not put it at the place with a lot of dust in the air; do not put it in the vicinity of air-conditioning or blowing in the wind; do not put it in place of direct exposure under the sun; do not put it in place of heat flow; and do not put it in to generate and electric or magnetic field.

3.Please handle the heavy sample lightly while weighing, do not impact the weighing pan. If impacts it seriously, may lead to machenical system of the balance can not reset.

4.Please be careful while weighing liquid, avoid any liquid to inflow the internal balance from the bottom of weighing pan. If a similar situation occurs, should unplug the power supply immediately, clean internal liquid, or wait for the liquid to evaporate, ensure no residual liquid, then continue to use the balance.

5.A piece of lightly damp cloth is allowed to cover the balance after using.

6.Please avoid any liquid on the surface of the balance.

2 Performance

Code	**8304-120**	**8304-220**
Maximum weighing	120g	220g
Minimum weighing	10mg	10mg
Resolution (d)	0.1mg	0.1mg
Verification interval (e)	1mg	1mg
Accuracy (m is load)	m≤50g: ±0.5mg; 50g<m≤200g: ±1mg	m≤50g: ±0.5mg; 50g<m≤200g: ±1mg; m>200g: ±1.5mg
Weighing pan size (Ød)	Ø90mm	
Operation temperature	10~30°C	
Operation humidity	20~85% RH	
Power supply	power adapter (12V/2A)	
Dimension (L×W×H)	230×310×320mm	

3 Display

No.	Display information	Notes
1	g	Reading unit is"gram
2	Ct	Reading unit is"carat
3	Lb	Reading unit is"pound
4	Oz	Reading unit is"ounce"
5	PCS	Count weighing state
6	%	Percentage weighing state
7	O	Data stable identification
8	CALIN	Enter into calibration
9	CALDN	Load calibration weight 100g
10	CAL---	Calibrating...
11	CAL-UP	Remove calibration weight
12	CAL-END	Calibration finish
13	E	Overload max.capacity
14	-E	No weighing pan or incorrect weighing pan
15	--------	σSETτkey effective hint
16	”	Data processing
17	SAVE---	Save

4 Installation

1. Installation of weighing pan's components: Install pan support and weighing pan accurately on the weighing pan support.

2. Adjust level: Adjust the two adjustable feet on the front bottom balance and be sure the level bubble in the middle part.

3. Plug the balance： Insert one end of power adapter into the 110-220V/50HZ AC plug base, and the other end of power adapter is inserted into the power plug base at rear part of the balance.

4. Power on: After plugging the balance, model number “ESJ-4” will be displayed, 3 seconds later, display becomes black and displays power off state. Press ON/OFF key, “0.0000g” displays. If “P FAIL” displays, it means the balance was the previous non-normal shutdown, that is to shut down the balance without pressing OFF key.
Press ON/OFF key, the balance could be power on normally, displays “0.0000g”.

5 Function setting

In the state of power-on, press SET key and then press PRINT key to display Cx-y, x is number 1-9, press TARE key to check circularly; y is the value set by Cx parameter, press PRINT key to change x. After setting, press OFF key, balance will display “SAVE……”, press TARE key and “SEND” displays, wait for about 2 seconds, save finishes and updates data and back to weighing state. Press ON/OFF key twice to take effect new parameter. Please refer to below list as details:

Cx	Cx-y	Description
C1: Calibration way	C1-0	Auto-calibration (just for internal calibration balance)
	C1-1	Manual external weight calibration
C2: Basic sample data option in count weighting state	C2-0	Quantity is 10
	C2-1	Quantity is 20
	C2-2	Quantity is 50
	C2-3	Quantity is 100
	C2-4	Quantity is 1000
C3: Zero tracking	C3-0	No zero tracking
	C3-1	1d
	C3-2	2d
	C3-3	3d
	C3-4	4d
	C3-5	5d
	C3-6	Can not be oeprated by user
C4: Serial port baud rate option	C4-0	1200bps
	C4-1	2400bps
	C4-2	4800bps

Cx	Cx-y	Description
C5: Data output way option	C5-0	Stable output
	C5-1	Command control output
	C5-2	Continuous output
	C5-3	Press PRINT key output
C6: Key sound	C6-0	no
	C6-1	yes
C7: Anti-interfence degree	C7-0	Low
	C7-1	Midium
	C7-2	High
	C7-3	Strong

* Return to zero stable output: Load weight when displays “0.0000g”, after stable, output stable data to external device.

* Stable output:
When data is stable again, output current stable data.

* Command control output:
The P<CR<LF> commands which are outputed by the PRINT key on the balance through serial port are regarded as “print control command”. There will be a group of current weight data output after the balance receives a command.

* Continuous output:
The balance is fixed to send the weight data every 0.3 second.

3.Command control:
Effective commands are as follows: ①O<CR><LF> ON/OFF command: same function with ON/OFF key on the balance (4F 0D 0A);

②T<CR><LF> TARE command: same function with TARE key on the balance (54D 0D 0A);

③C<CR><LF> mode conversion command: same function with CAL key on the balance (43 0D 0A);

④M<CR><LF> mode conversion command: same function with MODE key on the balance (4D 0D 0A);

⑤P<CR><LF> print command: same function with PRINT key on the balance. A group of current weight data will be output to external device as soon as the balance receives this command (50D 0D 0A);
<CR><LF> descriptions are as follows:
<CR>: Return symbol（0D）
<LF>: Enter symbol（0A）

6 Usage

1. Ordinary weighing:
（1）After plugging, in order to achive best weighing effect, balance should be preheated at least 30 minutes.
（2）Keep weighing pan clean, press ON/OFF key and “0.0000g” displays.
（3）If other weighing units or weighing modes are needed, press MODE key to adjust the displayed data to other units or weighing mode data.
（4）Open the door of weighing chamber, put sample onto the middle of weighing pan gently, then close the door and wait for reading data after stable.
（5）Open the door of weighing chamber to remove sample for the next weighing; if do not weigh, please close the door to avoid dust into the balance.

2. Container weighing:
（1）Put the container on the weighing pan;
（2）Press TARE key after “O” (stable mark) displays, “0.0000g” is displayed;
（3）Put sample into the container;
（4）Read the value of sample after “O” (stable mark) displays;

3. Count weighing:
（1）Choose sample's quantity according to system parameter list;
（2）Press TARE key and “0.0000g” displays after stable;
（3）Press MODE key to “Count Mode” state;
（4）Put sample in the middle of weighing pand and close the door of weighing chamber;
（5）Press SET key and balance system will take sample according to C2 parameter;
（6）After sampling, balance will display the sample's quantity according to C2 parameter. Remove the sample and wait for balance to stable zero, user can operate count weighing.

Attention: The minimum readable value of sample quantity could not be less than the minimum resolution of balance.

4. Percentage weighing:
（1）Press TARE key and “0.0000g” displays after stable;
（2）Press MODE key to “Percentage Mode” state;
（3）Put sample in the middle of weighing pand and close the door of weighing chamber;
（4）Press SET key and balance system will take this reference as 100.00% basic value;
（5）After simpling successfully, “100%” displays. Remove sample and after balance returns back to stable zero, user can operate percentage weighing.

Attention: The minimum readable value of sample quantity could not be less than the minimum resolution of balance.

7 Calibration

100g External weight calibration:
（1）Remove sample out of weighing pan, close the door of weighing chamber, “0.0000g” displays;
（2）Press CAL key and “CAL IN” –“CAL……” displays, finally “CAL dn” displays several seconds later;
（3）Put F1 grade 100g standard weight on the middle of weighing pan and close the door of weighing chamber;
（4）When “CAL UP” displays (5-8 seconds later), remove weight;
（5）Close the door of weighing chamber and wait for 5-8 seconds, “CAL-END” displays and calibration is finished;
（6）If the deviation is more than ±1 between displayed weight value and calibration weight, re-calibration is needed till the deviation is within ±1, that means calibration is finished successfully

200g External weight calibration:
(1) Remove sample out of weighing pan, close the door ofweighing chamber, “0.0000g” displays;
(2) Put F1 grade 100g standard weight on the middle of weighing pan and close the door of weighing chamber;
(3) Press SET key and “------“ displays, then press MODE key and “CAL 200” displays;
(4) The calibrated value will be displayed after 5-8 seconds, calibration is finished.

8 RS232 communication

1.Serial port working mode: Induction communication
Baud rate: please refer to system parameter list C4 parameter
Start bit: 1
Data bit: 8
Check bit: no
Stop bit: 1

2.Weight data transmitting mode: please refer to system parameter list C5 parameter

3.Weight data transmitting format:
FXXXX.XXXXKKK<CR><LF> have the following significance:
F: sign bit “+” or “-”
X: 0-9 weight data
. : decimal point
K: reserved three bit weighing unit symbol, right side align, spaces added if less than three bits
<CR>: Return symbol
<LF>: Enter symbol
If weight data is +10.0000g, the data format of serial port is:
+0010.0000g<CR>LF>

4.Decision method of stable and unstable data output:
When unstable data outputs, non-unit incating bit of data serial port, KKK three bits are spaces; when stable data outputs, unit information will be output.

5.External serial data line connection method:

Electronic Balance	Computer
9 needles	9 holes
2	2
3	3
5	5

Electronic Balance	Serial port Printer
9 needles	25 needles
2	2
3	3
5	7

Connection diagram of electronic balance and computer, printer
Attention: length of data line should not exceed 15 meters.

9 Attention of cleanliness

Unplug power line before cleaning;
- Suggest use alcohol or soft solvents instead of corrosive cleaning detergent;
- Do not let water or other liquid splashed into the balance while cleaning;
- Use a dry soft cloth to dry off the balance after cleaning.