

Analytical Balance ES-J series

User Manual



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One: 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 mechanical 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.

Two: ES-J series balance features

- LCD liquid crystal display screen, more clear and bright, convenient for customers to read weighing value.
- All transparent glass windshield, samples can be seen entirely and clearly.
- Standard RS232 communication port——realize the communication with computer, printer or other device.
- Multiple weighing units change.

Three: Balance appearance photo



Four: ES-J series balance technical parameters

Test conditions: Room temperature 20°C, no air flow and no dust closed environment.

| Model No. | ES-J120 | ES-J220 | ES-J120A | ES-J220A |
|-----------------------------------|----------|---------|----------|----------|
| Calibration | External | | Internal | |
| Max capacity (g) | 120 | 220 | 120 | 220 |
| Readability (mg) | 0.1 | | | |
| Repeatability (mg) | ±0.1 | | | |
| Linearity error (mg) | ±0.2 | | | |
| Operational temperature range °C | 13~25 | | | |
| Operational moisture range RH | 10%~70% | | | |
| Response time (Average value) (s) | 2.5 | | | |
| Pan diameter (mm) | 90 | | | |

| | |
|---------------------------------|-----------------------------|
| External dimension (L*W*H)mm | 230*310*330 |
| Preheat time (minutes) | 20-30 |
| Baud rate options | 300 600 1200 2400 4800 9600 |

Five: ES-J series balance display and keypad drawings

| 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 | CAL IN | Enter into calibration |
| 9 | CAL DN | 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 | ----- | “SET” key effective hint |
| 16 | • | Data processing |
| 17 | SAVE--- | Save |
| 18 | S---END | Save finish |

Six: 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”.

Seven: Function setting

1 Back-light switch:

In the state of power-on, press SET key twice to open back-light. If the current state is open, that is to close back-light.

2 Parameter 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 “S-END” 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 |
| | C1-2 | Manual internal calibration |
| | C1-3 | Adjustment between internal and external calibration |
| C2: Basic sample | C2-0 | Quantity is 10 |

| | | |
|---|------|------------------------------|
| data option in count weighting state | 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 operated by user |
| C4: Serial port baud rate option | C4-0 | 1200bps |
| | C4-1 | 2400bps |
| | C4-2 | 4800bps |
| | C4-3 | 9600bps |
| C5: Data output way option | C5-0 | Return to zero stable output |
| | C5-1 | Stable output |
| | C5-2 | Command control output |
| | C5-3 | Continuous output |

| | | |
|--------------------------------|------|------------------------|
| | C5-4 | Press PRINT key output |
| C6: Key sound | C6-0 | no |
| | C6-1 | yes |
| C7:Anti-interference degree | C7-0 | Low |
| | C7-1 | Medium |
| | 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 outputted 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)

Eight: Usage

1. Ordinary weighing:

(1) After plugging, in order to achieve 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 pan 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 pan 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 sampling 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.

Nine: Calibration

1. External calibration

Menu setting (C1-1)

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 of weighing

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.

2. Automatic internal calibration (just for internal calibration balance)

Menu setting (C1-0).

Automatic adjustment is performed:

(1) After the balance is turned on, it will undergo a fully automatic calibration.

(2) Having detected a change in temperature by 2°C from the previous adjustment,

(3) A defined time interval has elapsed, selectable 2, 3, 4, 6, 8 hours (C7-0 – C7-4).

Attention: During the calibration process of the balance, it is prohibited to perform any operations on the balance.

In case of the adjustment error (e.g. object on the plate) the following

error message will be displayed: <CAL NO>, manually repeat the adjustment procedure.

3. Manual internal calibration (just for internal calibration balance)

Menu setting (C1-0 / C1-2)

- (1) Press CAL button in the weighing mode.
- (2) The adjustment is carried out automatically.
- (3) After the successful adjustment the scales will be automatically switched back to the weighing mode.

In case of the adjustment error (e.g. object on the plate) the following error message will be displayed: <CAL NO>, repeat the adjustment procedure.

4. Adjustment between internal and external calibration

Menu setting (C1-3)

- (1) In the weighing mode, press the CAL button, the balance displays "CAL 100", then the balance shows "", followed by "CAL dn".
- (2) Then place the standard E2 weight of 100g on the balance pan, the balance displays "" indicating that it is comparing, and then the balance shows "CAL up". At this point, remove the E2 weight of 100g, the balance displays "_____", and then shows "-----", the calibration is complete and it returns to the weighing mode.

Note: Before calibrating the balance, please adjust the level first to ensure the balance is in a horizontal state. Allow the balance to warm up for more than 30 minutes after powering on.

Ten: 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.XXXXXKKK<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 indicating 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 | | Electronic Balance | | Serial port Printer |
|-----------------------|-------|----------|--|-----------------------|-------|------------------------|
| 9 needles | ----- | 9 holes | | 9 needles | ----- | 25 needles |
| 2 | ----- | 2 | | 2 | ----- | 2 |
| 3 | ----- | 3 | | 3 | ----- | 3 |
| 5 | ----- | 5 | | 5 | ----- | 7 |

Connection diagram of electronic balance and computer, printer

Attention: length of data line should not exceed 15 meters.

Eleven: 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.

Twelve: Troubleshooting

| Failure phenomenons | Failure reasons | Solutions |
|---------------------------------------|---|--|
| Can not power on | <ul style="list-style-type: none"> • Do not connect power supply • AC/DC damaged | <ul style="list-style-type: none"> • Plug power cord • Change power adapter |
| Displayed value is unstable | <ul style="list-style-type: none"> • Working environment is bad | <ul style="list-style-type: none"> • Improve working environment to avoid vibration and air disturbance |
| | <ul style="list-style-type: none"> • Door of weighing chamber is not closed tightly | <ul style="list-style-type: none"> • Close the door tightly |
| | <ul style="list-style-type: none"> • Foreign object or scratch between weighing pan and housing of balance | <ul style="list-style-type: none"> • Remove foreign object, turn weighing pan to prevent scratch |
| | <ul style="list-style-type: none"> • Power supply is Unstable and exceed allowable value • Measured sample is unstable (e.g. absorb water or evaporate) | <ul style="list-style-type: none"> • Access 220V AC power regulator |
| Displayed value is out of accord with | <ul style="list-style-type: none"> • Balance is not calibrated | <ul style="list-style-type: none"> • Calibration |
| | <ul style="list-style-type: none"> • Do not tare before | <ul style="list-style-type: none"> • Press TARE key |

| | | |
|------------------------|-----------------------|---------------------|
| actual weight value | weighing | |
| | • Do not adjust level | • Adjust level feet |

Thirteen: Maintenance

We will guarantee the balance within one year from the date of sale except the following status:

- 1.The guarantee period is expired;
- 2.The balance is damaged due to user’s own negligence.
- 3.The balance is damaged due to the exposure to the environment which has radioactive or corrosive material.

Fourteen: Packing list

| No. | Description | Quantity |
|-----|---------------------------------|----------|
| 1 | Balance main body | 1 |
| 2 | Weighing pan | 1 |
| 3 | Weighing pan support | 1 |
| 4 | English user manual | 1 |
| 5 | Standard weight (F1 grade) 100g | 1 |