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Operating Manual

Industrial Precision Balances

SSH

External Calibration



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INTRODUCTION

Thank you for buying SSH Series high capacity electronic balance. This series high quality precision balances will ease your daily workload while delivering exact results.

Please read this manual carefully before you login to operate your balance, so as not to damage your balance by misoperating. This manual covers Models SSH 94, SSH 93, SSH 92, SSH 91.

This series of balances are the products of yours of research, design, development as well as testing. Care has been taken during the manufacturing process of these balances to ensure that they will perform accurately and reliably for many years.

Options : RS-232C/Interface

Underhook for weighing under the balance

SPECIFICATION

Model	SSH 94	SSH 93	SSH 92	SSH 92
Capacity	20 kg	30 kg	50 kg	60 kg
Readability	0.1 gm	0.1 gm	1 gm	1 gm
Repeatability	± 0.2 gm	± 0.2 gm	± 2 gm	± 2 gm
Linearity	± 0.2 gm	± 0.2 gm	± 2 gm	± 2 gm
Pan Size (mm/inch)	340 x 300 / 13.6 x 12			
Operating Temperature	15 ⁰ C – +30 ⁰ C			
Calibration Mass	20 kg	30 kg	50 kg	60 kg
Power	110,230V/10,5V AC			
Output Signal	RS 232			
Display type	VFD			
Weight	Approximate 18.5 kg			
Dimension	314 x 164 x 460 (W x H X D) mm			

INSTALLATION

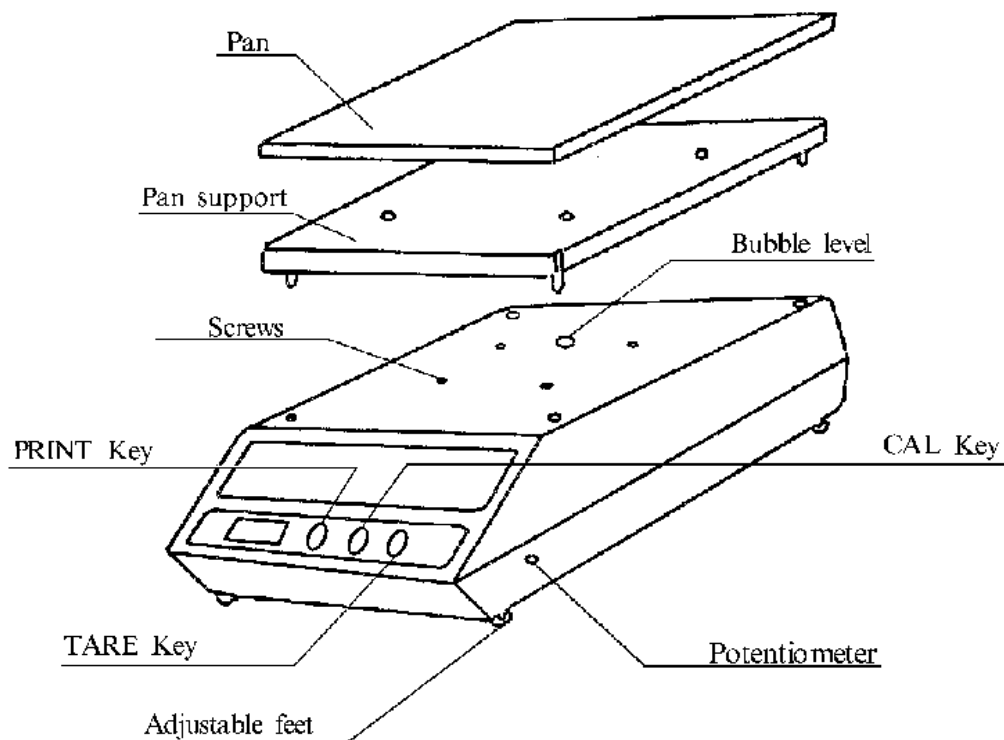
Unpacking Your Balance

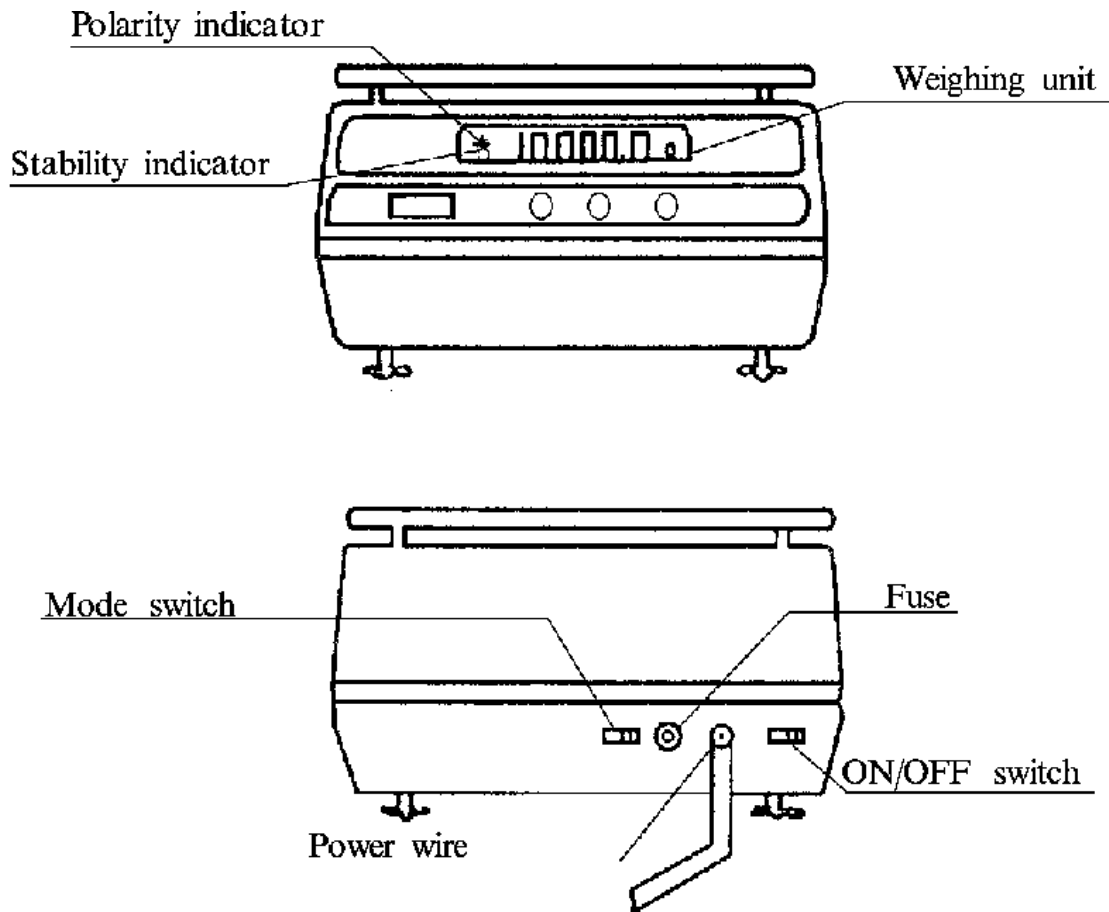
Remove the balance from the carton carefully. It is recommended to keep the packing materials for storing or transporting again.

In the carton you should find the balance together with:

- a pan
- a pan support
- a spare fuse (0.5)
- a plastic plug (see page 15)
- a power supply cord
- an instruction manual

Your Balance





Environment Requirements

- The balance must be level.
- The balance should be put on a firm weighing table.
- The balance should be installed in a place where there is less interference of airflow or vibration.
- DO NOT install the balance in a direct sunshine.
- DO NOT install the balance in extreme moisture or dust.
- DO NOT use your balance in a place where there is danger of explosion.
- Protect your balance from aggressive chemical vapors.
- Keep your balance away from the equipment containing or generating magnetic current.

Setting up your balance

- Put the balance on a stable surface
- Level the balance by turning the adjustable feet until the bubble in the level indicator is in the center.
- Place the pan support and the pan on the balance.
- Plug the balance into wall socket.

WEIGHING

- For more accuracy, balance should be warmed up at least one hour.
- DO NOT use sharp articles (such as pencil or ball pen etc.) to touch the keys. Use your finger only.
- Always gently place items to be weighed on the pan. Never drop them on the pan.
- To weigh a magnetic material, & shield should be put on the pan to keep the magnetic material 3 ~ 5 cm away from the pan. Or you can use the “weighing under the balance” mode.

Calibration

Calibration Mass

SSH 94	20 kg	SSH 92	50 kg
SSH 93	30 kg	SSH 91	60 kg

- Press ON/OFF switch in the rear of the balance to turn balance on.
- Display SELF – CHECK mode.
- After about 5 seconds zero will be displayed.
- Warm up at least one hour.
- Press TARE key to zero the display.
- Press CAL key.

- Display CAL 0.0g. If the display is not zeroed completely. Press TARE key again.
- Place the calibration mass on to the pan gently.
(Take ES – 20KA as an example).
- Press CAL key again.
- Display C 20000.0g and then CAL End will be displayed.
- And then 20000.0g will be displayed.
- Remove the mass from the pan gently.
- Display 0.0g. The balance now comes into weighing mode.

Verification Of Calibration

- Place the calibration mass on to the center of the pan gently when 0.0g is displayed.
- It is calibrated if “20000.0g \pm 0.1g” is displayed. Remove the weight from the pan.
- If the value displayed is more or less than \pm 0.1g , please repeat calibration procedure until it is calibrated.

NOTE # 1: IF CAL no IS DISPLAYED, THAT MEANS THE BALANCE CAN'T BE CALIBRATED. CHECK IF THE CALIBRATION MASS IS WRONG CALIBRATE THE BALANCE AGAIN USING A RIGHT CALIBRATION MASS.

NOTE # 2: IF, WHEN USING THE CORRECT CALIBRATION MASS, THE VALUE DISPLAYED IS OVER OR UNDER THE ACTUAL WEIGHT, USE THE POTENTIOMETER TO MAKE THE FINAL ADJUSTMENT IN THE FOLLOWING MANNER.

- Remove the plastic plug on the right hand side of balance. You will find an adjustable potentiometer.
- Use a small screwdriver supplied with the balance to adjust the value displayed.
- To increase the value displayed, turn the screw on the potentiometer clockwise.
- To decrease the value displayed, turn the same screw counter – clockwise.
- When the value displayed approaches to the actual weight, please use CAL key to calibrate the balance again.

Simple Weighing

- Make sure nothing is on the pan.
- Turn the display on by pressing the ON/OFF switch on.
- When “0.0g” is displayed, place the item to be weighed gently on the center of the pan.
- Read out the weight displayed when stability indicator appears.
- Remove the item from the pan.

When a container is necessary to be used.

- Press TARE key to zero the display.
- Place an empty container on to the pan. The weight of the container will be displayed.
- Press TARE key to cancel the weight and then “0.0g” will be displayed.
- Place the item to be weighed into the container. The weight of the item will be displayed.
- Read out the value displayed when stability indicator appears.
- Remove the item from the pan.

Weighing – in

- Press TARE key to zero the display.
- Place an empty container on to the pan. The weight of the container will be displayed.
- Press TARE key to cancel the weight of the container; “0.0g” will be displayed.
- Start filling the container. The weight of the item filled will be displayed.
- Stop filling when the target weight is reached.
- Press TARE key to cancel the weight and then “0.0g ” will be displayed.
- Start filling another item into the container. The weight of the new item filled will be displayed.
- Stop filling when the target weight is reached.
- Press TARE key to cancel the weight. “0.0g ” will be displayed.
- Continue to do this in the same way until the final target weight is reached.
- Empty the pan.
- Press TARE; “0.0g ” will be displayed.

Weighing – out

- Press TARE to zero the display if the display is not zero completely and then “0.0g ” will be displayed.
- Make sure nothing on the pan.
- Place a full container on the pan. The weight of the container + the content will be displayed.
- Press TARE key to cancel the weight; “0.0g ” will be displayed.
- Take some of the content out of the container. The negative weight

on the display is that of the content removed.

- Stop taking out when the target is reached.
- Empty the pan.
- Press TARE; “0.0g ” will be displayed.

Deviation Weighing

- Press TARE to zero the display.
- Place a weight or a sample as a reference on to the pan. The weight of the reference will be displayed.
- Press TARE to cancel the weight and then “0.0g ” will be displayed.
- Place a comparison on to the pan. The deviation between comparison and reference will be displayed either in positive or in negative.
- Empty the pan.
- Press TARE; “0.0g ” will be displayed.

Weighing Under The Balance

If you intend to make a specific gravity determination or to weigh a sample should be immersed in a special liquid or atmosphere, you need weighing under the balance. Use the under weighing hook.

Preparation

- Under the balance you will find a cover with two screws.
- Remove the cover. You will find a post for installing the hook.
- Fasten the hook to the weighing mechanism.
- Hang a wire through the hole.
- Place the balance on a table with a hole in it or a stand specially designed for this use. Pass the wire through the hole.
- Suspend a plate – like container on the other end of the wire.
- Recalibrate the balance with hook, wire and plate.

Now you are ready to weigh under the balance.

TROUBLESHOOTING

PROBLEM	CAUSES	SOLUTION
No segments appear in the display	<ul style="list-style-type: none"> . The power supply cord is not plugged in . The fuse is blown 	<ul style="list-style-type: none"> . Plug in power supply cord and plug the balance into wall socket . Change the fuse . Send your balance to service center if the new fuse blows again.
The value displayed changes constantly.	<ul style="list-style-type: none"> . Unstable environment . A foreign object is caught between the pan and balance housing . The object to be weighed is not stable 	<ul style="list-style-type: none"> . Move your balance to a place where there is less vibration or breeze. . Remove the foreign object
The value displayed is obviously wrong	<ul style="list-style-type: none"> . The balance is not calibrated . The balance was not tared before weighing . The balance is not level 	<ul style="list-style-type: none"> . Calibrate your balance properly . Tare before each weighing . Level the balance with adjustable feet

CARE AND MAINTENANCE

Care

1. DO NOT use a sharp object (such as pencil or ballpen etc.) to touch the keys. Use your finger only.
2. DO NOT let object fall on the pan, otherwise the weighing system will be damaged.
3. DO NOT place a weight beyond the range of the balance on the pan.
4. DO NOT disassemble the balance. Only trained technicians are authorized to do service.
5. DO NOT expose your balance to extreme moisture or dust over long periods of time.
6. It is better to cover your balance after use and at night.
7. Keep your balance clean and dry.
8. DO NOT use solvents to clean the balance.
9. Protect the internal parts from liquid spills and excessive dust.

Cleaning

- Unplug the power supply cord before cleaning.
- DO NOT use any aggressive cleaning agents (solvents or similar agents). Use a piece of damp cloth with a mild detergent.
- Be careful that no liquid enters the balance housing. After cleaning, wipe down the balance with a piece of soft, dry cloth.

RS – 232C INTERFACE

This RS – 232C string interface can be compatible with standard RS – 232C interface.

Specifications

Transmission form : Asynchronous transmission, unidirectional

Data format : Baud rate: 1200, 2400, 4800, 9600

Data bits : 8 bits

Parity: None

Stop bit: 1 bit

Code: ASCII

Data Output – Auto Print Mode

There are three types of modes: Auto Print A, Auto Print B, and Auto Print C.

– Auto Print A

When the balance and a printer or a computer connects with the balance are turned on, the data in the balance will be output continuously unless you turn the balance and/or the printer, or computer off.

– Auto Print B

Whenever the balance becomes stable (stability indicator appears), one group of data will be output.

– Auto Print C

NOTE: You should empty the pan and zero the display before each weighing in Auto Print C.

When the balance becomes stable (stability indicator appears), one group of data will be output.

Data Format

× × × WT × × × + 100.0000 × × g <CR><LF><LF><LF>

× = space (20H)

<CR> = carriage return

<LF> = line feed

Connection

	balance	printer	
1	<u>STB</u>	<u>STB</u>	1
2	<u>DATA1</u>	<u>DATA1</u>	2
3	<u>DATA2</u>	<u>DATA2</u>	3
4	<u>DATA3</u>	<u>DATA3</u>	4
5	<u>DATA4</u>	<u>DATA4</u>	5
6	<u>DATA5</u>	<u>DATA5</u>	6
7	<u>DATA6</u>	<u>DATA6</u>	7
8	<u>DATA7</u>	<u>DATA7</u>	8
9	<u>DATA8</u>	<u>DATA8</u>	9
10	<u>ACK</u>	<u>ACK</u>	10
11	<u>BUSY</u>	<u>BUSY</u>	11
.			.
.			.
.			.
25	<u>GND</u>	<u>GND</u>	25

Setting of Baud Rate and Data Output Modes

- Press ON/OFF key to turn the display off.
- Unplug the power supply cord from the balance.
- Remove the housing of the balance and you will find a group of 6 dipswitch segments on a dipswitch assembly on the interface board.

- Set the Baud Rate and Data Output Modes by turning the dipswitch.

Segment	1	2	3	4	5	6
Function	Baud Rate			Data Output Mode		

Setting Baud Rate

Segment		Baud Rate
1	2	
ON	ON	1200
OFF	ON	2400
ON	OFF	4800
OFF	OFF	9600

Setting Data Output Modes

Segment		Data Output Modes
5	6	
ON	OFF	Auto Print A
OFF	ON	Auto Print B
OFF	OFF	Auto Print C
ON	ON	Print Key

The Original Factory Setting

Segment	1	2	3	4	5	6
State	OFF	ON	OFF	OFF	ON	ON

Example of a program for receiving a weighing data from the balance.

(Baud Rate: 2400)

```
10 CLS
20 OPEN "COM1:2400,N,8,1,CS,DS" AS# 1
30 OPEN "SCRN:" FOR OUTPUT AS# 2
40 PRINT "1. START"
50 PRINT "2. STOP"
60 INPUT A%
70 IF A% < 1 OR A% > 2 THEN PRINT "AGAIN"; GOTO 60
80 ON A% GOSUB 90,140
90 B$ = INKEY$
100 IF B$ = "2" THEN CLOSE: GOTO 140
110 LINE INPUT #1, X$
120 PRINT #2, X$
130 GOTO 90
140 END
```

※ Print Key

When the PRINT key on the front panel of the balance is pressed, one group of data will be output.

INSTRUCTION FOR REMOVING THE “TRANSPORTATION LOCKING MECHANISM”

You should remove the locking mechanism, which is on the bottom of the drain pan on the balance. You first need to remove the two screws “M3” on the blind flange, then remove the screw M5, (when removing, to keep the flexures, you should remove by keeping straight.) Then plug up the hole with plastic plug supplied. Replace two M3 screws.

